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**NAVAL
POSTGRADUATE
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MONTEREY, CALIFORNIA

THESIS

**THE RELATIONSHIP BETWEEN SLEEP REGIMEN AND
PERFORMANCE IN UNITED STATES NAVY RECRUITS**

by

Charles H. Andrews

September 2004

Thesis Advisor:

Nita Lewis Miller

Second Reader:

Thomas W. Lucas

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**THE RELATIONSHIP BETWEEN SLEEP REGIMEN AND PERFORMANCE
IN UNITED STATES NAVY RECRUITS**

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN OPERATIONS RESEARCH

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ABSTRACT

Fatigue due to sleep deprivation is a major factor in both mental and physical performance. Failure of Recruits to receive the proper quality and quantity of sleep can be detrimental to a Recruit's safety and can diminish the amount of information learned during training. During the 1980s, the sleep regimen was decreased to 6 hours of sleep per night. In 2002, a decision was made to give U.S. Navy Recruits an additional two hours of sleep per night. This latest modification was selected to coincide with the acknowledged adolescent/young adult circadian rhythms.

The purpose of this study was to determine the impact of the new eight-hour sleep regimen using standardized test scores as a performance measure. One year of data with the eight-hour sleep regimen is compared to two separate years when only six hours of sleep was allowed.

There is a significant difference, $F(2, 33) = 29.82, p < .0001$, between the test scores of Recruits receiving 6-hours of sleep and 8-hours of sleep. On average test scores rose by 11 percent with the additional sleep. The odds of observing such a difference by chance is less than one in ten million.

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EXECUTIVE SUMMARY

United States Navy Recruits are trained at the Recruit Training Command (RTC) in Great Lakes, Illinois. This training lasts approximately 9 weeks or 63 days. During this time, Recruits are taught basic military knowledge and skills that prepare them for operational service in the fleet. Recruits are also tested periodically on this training. Until the 1980s, USN recruits received 8 hours of sleep per night.

During the 1980s, the sleep regimen was decreased to 6 hours of sleep per night and the Recruits were required to stand watches on some nights, still further limiting the amount of sleep individual Recruits could receive. To some extent, Recruit sleep may have been purposely restricted in an attempt to select out those individuals who might not be able to cope with stressful conditions of life at sea (also known as stress diathesis). The increasing demands of the training schedule also impacted Recruit sleep with a gradual encroachment of the training regimen into allotted sleep time.

In December 2001, a decision was made to change Recruit sleep regimen from 6 to 7 hours of sleep (2100 to 0400). In early 2002, the regimen was changed to 8 hours (2100 to 0500). In May 2002, the sleep regimen was finalized to eight hours from 2200 to 0600. This latest modification was selected to coincide with the acknowledged recognized adolescent/young adult circadian rhythms.

Fatigue is known to degrade both mental and physical performance in humans. Fatigue among Recruits at NSTC Great Lakes is common due to the demanding training schedule and limited opportunity for sleep. Although Recruits are currently allotted 8 hours of sleep per night, a study conducted recently showed that Recruits actually receive from individual averages of 5.8 to 6.7 hours of sleep (Baldus, 2002). These results indicate that the amount of sleep that could have been obtained prior to the 2002 sleep increase was almost certainly less than 6 hours. Research has shown that less than 6 hours of sleep can result in impaired learning and can be as detrimental to human performance as 48 hours without any sleep (Van Dongen et al. 2003). This lack of sleep builds a sleep debt that has been shown to be a leading contributor to accidents and degraded performance (Dawson and Reid, 1997).

The purpose of this study was to determine if there is an impact of the new eight-hour sleep regimen on a performance measure such as test scores. One year of data with the eight-hour sleep regimen was compared to two separate years when only six hours of sleep was allowed.

A multiple Comparison ANOVA and regression analysis was used to determine if 2003 was significantly different from 2000 and 2001. Three years of data were compared. The observations were the division test score averages for the month. The test scores of each individual were averaged to compute a division average. For the regression analysis, the test score is the dependent variable with ASVAB Score, year, and month as the independent variables. The ASVAB scores and month were included to account for

potential differences in the Recruits under the different sleep policies. In this model, year and month are categorical variables and ASVAB Scores is a numerical variable.

Results determined that there is a statistically significant difference, $F(2, 33) = 29.82, p < .0001$, between the test scores of Recruits receiving 6-hours of sleep and 8-hours of sleep. Recruits receiving 8-hours of sleep score an average of 11% higher than their counter parts receiving 6 hours of sleep. The odds of observing such a difference by chance is less than one in ten million.

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I. INTRODUCTION

This chapter provides an overview of Recruit Training Command and the reasoning behind this study. It gives background information from previous studies that led to this follow on study of the new Recruit sleep regimen. Finally, this chapter contains an outline of the thesis.

A. OVERVIEW

United States Navy Recruits are trained at the Recruit Training Command (RTC) in Great Lakes, Illinois. This training lasts approximately 63 days. During this time, Recruits are taught basic military knowledge and skills that prepare them for operational service in the fleet. Recruits are also tested periodically on this training. Until the 1980s, USN recruits received 8 hours of sleep per night.

During the 1980s, the sleep regimen was decreased to 6 hours of sleep per night and the Recruits were required to stand watches on some nights, still further limiting the amount of sleep individual Recruits could receive. To some extent, Recruit sleep may have been purposely restricted in an attempt to select out those individuals who might not be able to cope with stressful conditions of life at sea (also known as stress diathesis). The increasing demands of the training schedule also impacted Recruit sleep with a gradual encroachment of the training regimen into allotted sleep time.

In December 2001, a decision was made to change Recruit sleep regimen from 6 to 7 hours of sleep (2100 to 0400). In early 2002, the regimen was changed to 8 hours

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This thesis compares Recruit test scores from years when they received 6 hours of sleep with two years in which they received 8 hours. Test scores are compared for one division per month for January through December for each of the following years: 2000, 2001, and 2003.

B. BACKGROUND

Fatigue among Recruits at Naval Service Training Command (NSTC), Great Lakes is common due to the demanding training schedule and limited opportunity for sleep. Although Recruits are currently allotted 8 hours of sleep per night, a study conducted recently showed that Recruits actually receive from individual averages of 5.8 to 6.7 hours of sleep (Baldus, 2002). These results indicate that the amount of sleep that could have been obtained prior to the 2002 sleep increase was almost certainly less than 6 hours. It has been shown that less than 6 hours of sleep can result in impaired learning and can be as detrimental to human performance as 48 hours or total sleep deprivation (Van Dongen et al., 2003). This lack of sleep builds a sleep debt that has been shown to be a major contributor to accidents and degraded performance (Dawson and Reid, 1997).

The need for sleep of a typical 18 year old is between 8.5 and 9.25 hours per day, with a sleep pattern that is shifted. In this population sleep onset is later in the evening with an even later morning awakening (Dement and Vaughn, 1999, Carskadon, 2000). While the current Recruit

sleep regimen of 8 hours (from 2200 to 0600) does not mirror this exact need, it is hypothesized that the increase from 6 to 8 hours for average nightly sleep could produce positive changes in test performance of our future Sailors.

C. OVERVIEW OF THESIS

This thesis uses test scores as a performance measure to determine the impact of the new eight-hour sleep regimen. The eight-hour sleep regimen is compared to two separate years when only six hours of sleep was allowed.

Chapter II provides a review of literature related to sleep and learning, Armed Services Vocational Aptitude Battery Test (ASVAB), and drowsiness and safety. The Method section of the thesis is presented in Chapter III. The analytical strategy and statistical results are in Chapter IV. Finally, Chapter V offers conclusions and recommendations for future work. Appendices provide graphical displays of the actual data used for analysis.

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II. LITERATURE REVIEW

This chapter presents an overview of the current literature and research concepts necessary to understand the effects of human sleep on test scores and safety. Specifically, the relationship between sleep and learning, sleep and safety, and Armed Services Vocational Aptitude Battery Test (ASVAB) is discussed.

A. SLEEP AND LEARNING

During the learning process, some theorists suggest that memory passes through two stages (Wickens, 1973). The first is called short-term memory and the second is long-term memory. Long-term memory is stabilized over the next several hours following short-term memory. Long-term memory is thought of as being fixed in the brain. An example of memory transition is learning a new telephone number. If a distraction occurs immediately after learning the number, the number will likely be forgotten. If the same distraction is delayed by 24 hours, the number is likely to be recalled since the memory has been consolidated (Nader, 2003). Consolidation refers to the processing of memory traces during which the traces may be reactivated, analyzed and gradually incorporated into long-term memory (Maquet, 2001). It is thought that much of this memory consolidation takes place during sleep.

Sleep has been linked to enhanced memory of information acquired the previous day. The exact phase of the sleep cycle in which memory consolidation occurs is widely debated. However, it has been shown that less than six hours of sleep in a night degrades learning,

coordination, and overall performance (Moyer, 2002). The implementation of the new eight-hour sleep regimen resulted in Recruits receiving an additional 2 hours of allotted sleep and an average of 6.7 hours of sleep. On average this additional two hours translates to approximately one hour of actual sleep (Baldus, 2002). This new regimen may have a positive effect on the Recruit's ability to learn and recall information presented during recruit training.

B. SLEEP AND SAFETY

There are many military and civilian jobs that require work to be accomplished while only obtaining limited amounts of sleep. Jobs that result in disrupted sleep outside normal work hours or do not allow sufficient sleep for the individual to recuperate from daily fatigue result in reduced productivity and increased risks of error or injury at work sites. It has been shown that approximately 5.5 hours of sleep per 24 hours are required to maintain an acceptable level of performance (Naitoh, 1990). One example of poor performance was the EXXON VALDEZ accident where the watch mate received less than 5 hours of sleep in two separate periods prior to the accident (Sanquist, 1996). While the Naitoh study suggests that 5.5 hours of sleep is required to maintain minimally acceptable performance, other studies suggest that a single night sleep reduction of 1.5 - 2 hours is associated with a variety of human performance decrements (Gillberg, 1995). These studies also indicate that sleep which is fragmented by events such as watchstanding result in reduced alertness and performance.

There are well-documented variations in human performance over the 24-hour period. Human error rate is the highest between midnight and 0600 with a slight increase between 1300 and 1400. These data reflect well-known fluctuations in biological rhythms, including performance efficiency, and body temperature, and are thought to represent behavioral manifestations of circadian rhythms (Sanquist, 1996). Figure 1 shows the human error data obtained from studies of industrial tasks, including communications, meter reading, automobile and train driving, and hospital work (Folkard, 1995).

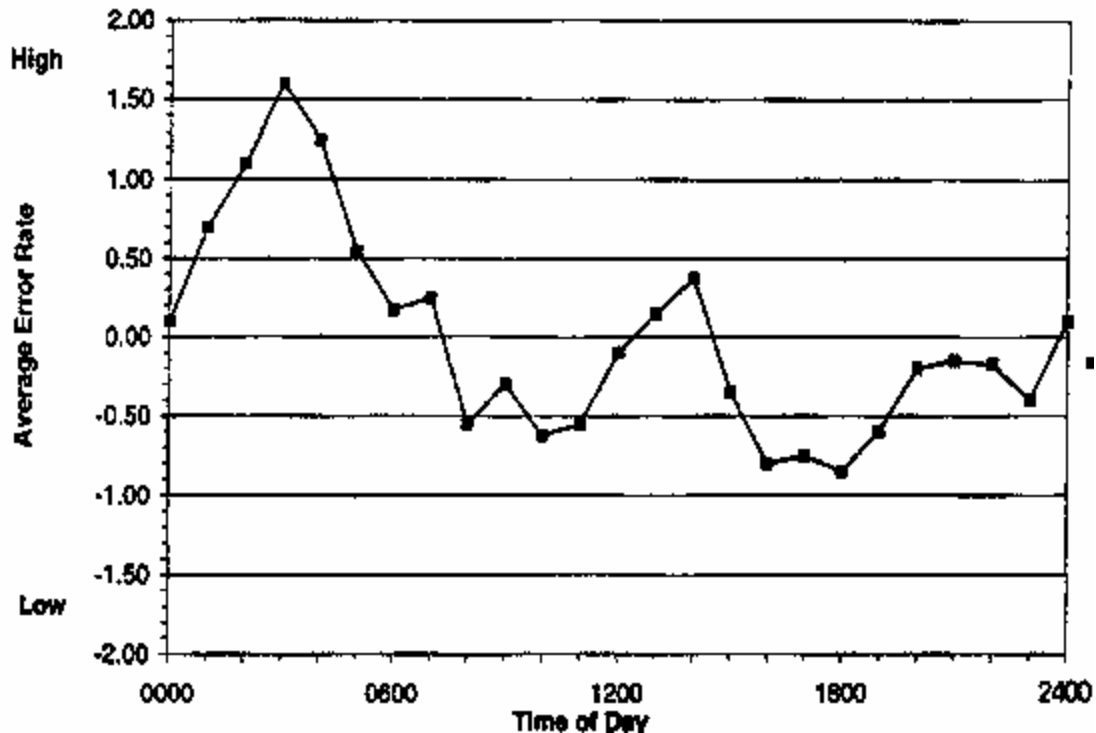


Figure 1. Aggregate Error Rates (standard scores) over a 24-Hour Period (From Folkard, 1995).

C. ASVAB (ARMED SERVICES VOCATIONAL APTITUDE BATTERY)

In 1948 Congress passed the Selective Service Act and mandated the Department of Defense (DOD) develop a uniform screening test to be used by all services. In response,

the DOD developed a 100 multiple-choice question test known as the Armed Forces Qualification Test (AFQT). The test consisted of vocabulary, arithmetic, special relations, and mechanical ability. These separate tests were combined to give an AFQT score and each service set their own minimum score for entry. In the 1960s, the DOD developed a standardized military selection and classification test and administered it throughout United States high schools. This test is called the Armed Services Vocational Aptitude Battery (ASVAB). In 1976, the ASVAB was introduced as the official entrance testing battery used by all services.

In 1980, the DOD, in cooperation with the Department of Labor, administered the ASVAB to 11,914 individuals, ranging from 16 to 23 years of age (Powers, 2003). The purpose of the study was to obtain data on vocational aptitudes of current youth and to establish national norms for the ASVAB. A person's ASVAB score is a percentile score based on results found in this study. The score itself is known as the AFQT score.

In December 2002, the ASVAB was revised with removal of two subtests and addition of one subtest. (Subtests Numerical Operations and Coding Speed were removed and the Assembling Objects subtest was added.) The number of subtests has changed throughout the years, but Arithmetic Reasoning, Word Knowledge, Paragraph Comprehension, and Mathematics Knowledge have remained constant. The current ASVAB consists of eight subtests, but only the four consistently used subtests listed above are used to compute the AFQT score. In order to obtain an AFQT score the Verbal expression score must first be computed. The Verbal Expression is the sum of the Paragraph Comprehension score

and the Work Knowledge score. The AFQT raw score is two times the Verbal Expression plus the Arithmetic Reasoning and Mathematics Knowledge. This AFQT raw score is used in Table 1 to obtain the AFQT percentile score.

AFQT SCORE	AFQT Percentile	AFQT SCORE	AFQT Percentile	AFQT SCORE	AFQT Percentile
80-120	1	186	34	222	68
121-124	2	187-188	35	223	69
125-127	3	189	36	224	70
128-131	4	190	37	225	71
132-134	5	191	38	226	72
135-137	6	192	39	227	73
138-139	7	193	40	228	74
140-142	8	194	41	229	75
143-144	9	195-196	42	230	76
145-146	10	197	43	231	77
147-148	11	198	44	232	78
149-150	12	199	45	233	79
151-153	13	200	46	234	80
154	14	201	47	235	81
155-156	15	202	48	236	82
157-158	16	203	49	237	83
159-160	17	204	50	238-239	84
161-162	18	205	51	240	85
163-164	19	206	52	241	86
165	20	207-208	53	242	87
166-167	21	209	54	243	88
168-169	22	210	55	244	89
170-171	23	211	56	245	90
172	24	212	57	246	91
173-174	25	213	58	247	92
175	26	214	59	248	93
176-177	27	215	61	249	94
178	28	216	62	250	95
179-180	29	217	63	251	96
181	30	218	64	252	97
182	31	219	65	253	98
183-184	32	220	66	254	99
185	33	221	67	255	99

Table 1. AFQT Percentile Score

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III. METHOD

This chapter first describes the participants of the study and then details the measures of performance used in the study. Finally, the procedures used to gather data about Recruit's test and ASVAB scores are specified.

A. PARTICIPANTS

The subjects for this study are the new Recruits that entered basic training during the January through December time frame in 2000, 2001, 2003. The test scores are from 12 sampled divisions per year, one division per month as detailed in section C. Procedure, of this chapter. For analyzing test scores, the divisions sampled from 2000, 2001, and 2003 are (2000): 001, 046, 092, 120, 158, 196, 230, 262, 316, 372, 448, 548, (2001): 001, 045, 090, 117, 159, 196, 233, 265, 301, 362, 425, 512, (2003): 001, 041, 082, 108, 138, 169, 193, 217, 243, 305, 368, 442. The following divisions are mixed gender (males and females in the same division) for the respective years 2000, 2001, 2003: (092, 158, 196, 230), (045, 196, 265, 512), (001, 138, 169, 193).

B. APPARATUS (ASVAB AND MILITARY KNOWLEDGE TESTS)

The objective of this thesis is to document changes in performance that may be attributed to the change in sleep policy for U.S. Navy Recruits. Performance was measured by standardized test scores administered to all Recruits during their training at Recruit Training Command. The test score data collection occurred in September 2003 and February 2004.

Standard tests of Recruit performance and Armed Services Vocational Aptitude Battery (ASVAB) scores were analyzed for three separate years. The scores from the year groups 2000 and 2001 were used to represent the six-hour sleep regimen. Two years of data from the six-hour sleep schedule were used to reduce the possibility that a single year was exceptional in either direction. Data from the 8-hour sleep schedule were collected in 2003.

C. PROCEDURE

In 2000 and 2001, each member was given a series of four tests during the course of training. In 2003, each member was given a series of three tests during the course of training. The three test series contained the same questions as in the four test series, but was consolidated to facilitate scheduling. Additionally, the tests from month to month are slightly different in that the questions are worded differently. This constant recycling of test bank questions is done to discourage test information (in USN parlance, "gouge") being passed from one division to the next.

The tests were administered by Recruit Division Commanders in a classroom setting. After a Recruit completed a test, the test was scanned to eliminate human error during grading. In the event a test could not be read by the scanner, the test was hand graded by a representative from the Curriculum Instructional Standards Department. A score lower than 64 percent, or 3.2 on the 5.0 scale, was considered failing. A retest was given

after remedial study sessions were completed by the Recruit. The maximum score a Recruit could receive on a retest was 64 percent or 3.2.

Many Recruits attrite prior to completing training and do not take the entire series of tests. There was not any ASVAB data available for the majority of Recruits that did not complete Recruit training. For this reason, only successful Recruits were used in determining a division's test score average. If a Recruit failed a test, the divisional average was computed using the failed test score vice the 3.2 received after a successful retest.

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IV. ANALYTICAL STRATEGY AND STATISTICAL APPROACH

This chapter presents the analysis of Recruit data and details the statistical methods. First, we cover data collection and entry into excel. Second, we review multiple comparisons ANOVA for both test scores and ASVAB scores. Third, we detail regression analysis of the data. Finally, a summary of the statistical analysis is presented.

A. OVERVIEW

In this analysis, 2597 recruits were entered into a Microsoft Excel© database. The database contained the Recruits Military Knowledge test and ASVAB scores. An example of the database is provided in Table 2.

Class 20001391	0101	0102	0103	0104																
Last 4 digits SSN	Grade	Grade	Grade	Grade	Average	TEST ID	GS	ARR	WOR	PAR	MAT	ELI	ASI	MEC	VER	COD	NUM	AFQT	AFQT%	
0226	4.10	4.40	4.20	3.90	4.15	21B	63	59	56	61	62	53	47	58	58	48	49	237	83	
0285	3.40	3.50	4.10	4.10	3.78	02D	42	39	54	44	52	49	51	42	51	54	48	193	40	
0375	3.90	4.10	4.60	4.00	4.15	22B	58	41	51	58	44	53	63	55	54	48	43	193	40	
0605	3.90	4.40	4.30	3.50	4.03	21B	42	44	48	50	51	51	52	62	49	49	49	193	40	
0638	3.90	3.70	4.00	4.00	3.90	22B	50	44	49	43	50	32	39	41	47	44	35	188	36	
0844	4.70	4.80	4.50	4.70	4.68	02D	66	64	60	59	66	53	53	68	60	55	60	250	96	
0883	3.40	4.20	4.50	4.40	4.13	04D	60	65	55	50	65	56	55	52	54	55	61	238	84	
0896	3.90	4.50	4.80	4.30	4.38	02D	62	62	59	62	65	60	57	63	60	58	62	247	92	
1003	3.60	4.50	4.70	4.30	4.28	01D	52	55	51	56	60	53	57	52	53	51	52	221	67	
1072	3.60	4.20	4.50	4.60	4.23	01D	46	45	51	50	41	46	44	40	51	50	49	188	36	
1146	4.30	4.60	4.40	4.10	4.35	18F	44	47	55	55	51	41	50	39	55	53	54	208	53	
1212	4.00	4.30	4.40	4.50	4.30	02D	52	59	56	56	57	49	53	61	56	46	56	228	74	
1275	3.80	4.10	4.40	4.10	4.10	19F	63	60	58	54	58	57	59	64	57	50	59	232	78	

Table 2. Example Test Score Data in Excel

The original data included Recruits that did not complete training. The Recruits that failed to complete training did not finish the entire series of military knowledge tests and were removed from the database. This analysis focuses only on Recruits that completed Basic Training.

In order to compare test scores between cohorts, one division per month (January-December) was selected from each year. The covariate entry score (ASVAB) was used since scores change significantly as a function of the time of year a recruit enters training. This covariate was used to identify divisions with significantly higher or lower aptitudes prior to training. An Analysis of Variance (ANOVA) was used to compare the two sleep conditions (6 vs. 8-hour). A multiple Comparison ANOVA and regression analysis was used to determine if 2003 was significantly different from 2000 and 2001. Three years of data were compared. The observations were the division test score averages for the month. The test scores of each individual were averaged to compute a division average.

In addition to the multiple comparison analysis, linear regression was done to test for relationships between amounts of sleep and test scores of an individual. The test score was the dependent variable with ASVAB Score, year, and month as the independent variables. These variables were included to account for potentially confounding differences in the Recruits.

B. MULTIPLE COMPARISON ANOVA FOR TEST SCORES

Multiple comparison ANOVA was used to determine if Recruit test performance was significantly different from year to year. This method makes an assumption that the data follow a normal distribution. Human performance on examinations such as these usually follows a normal distribution. Tukey's procedure, which uses the Studentized range distribution, was used to test the hypothesis that average test scores from each year are

equal (Devore, 2000). The distribution depends on two parameters: a numerator degrees of freedom m and a denominator degrees of freedom v (Devore, 2000). The numerator and denominator are determined using the equations 4.1. I is the number of populations being compared. J is the number of samples taken from each population.

$$\begin{aligned} m &= I \\ v &= I(J-1) \end{aligned} \quad (4.1)$$

A significance level of $\alpha = .01$ was chosen to determine the critical value, $Q_{\alpha, m, v}$, which is obtained from the Studentized range distribution. A significance level of .01 was chosen to reduce the chance of rejecting the null hypothesis; all divisional test score averages are equal, when it is true.

In Table 3, I is the number of populations being compared. J is the Division's test score average for each month in the respective year. Using S-PLUS (Mathsoft, 1999), the $Q_{\alpha, m, v}$ value was obtained by the command `qtukey(.99, 3, 33)`. The mean square for treatments (MSTr) and the mean square for error (MSE) are given in equations 4.2 and 4.3, respectively. The F statistic was computed using equation 4.4.

$$MSTr = \frac{J}{I-1} \sum_{I=1}^I (\bar{X}_I - Grandmean)^2 \quad (4.2)$$

$$MSE = \frac{\sum_{I=1}^I (SD_I)^2}{I} \quad (4.3)$$

$$Fstat = \frac{MSTr}{MSE} \quad (4.4)$$

In order to compare the different years of Recruits, the final step was to determine *Tukey's w*. Any population mean that differs by more than *Tukey's w* is considered to differ significantly at critical level *a*. *Tukey's w* is calculated using equation 4.5.

$$Tukey's\ w = Q_{\alpha, I, I(J-1)} \sqrt{\frac{MSE}{J}} \quad (4.5)$$

Observing the means in Table 3 we can see that the test score averages from 2003 are significantly higher than in 2000 and 2001. Figure 2 shows box plots of the averages and allows an easy visualization of the higher monthly averages in 2003. These box plots represent the range of data contained in Table 3 for the respective year. In 2000, the lowest divisional average was 3.78 in October and the highest was 4.09 in March. The median for 2000 was 3.90 and is represented by the blank line in the shaded portion of the box plot. In 2001, the lowest divisional average was 3.63 in November and the highest was 4.04 in August. The median for 2001 was 3.89 and is represented by the blank line in the shaded portion of the box plot. In 2003, the lowest divisional average was 4.01 in February and the highest was 4.69 in November. The median for 2003 was 4.38 and is represented by the blank line in the shaded portion of the box plot. The shaded portion of the box plots contains the middle 50 percent of monthly average scores.

The Division test score means are plotted in Figure 3 in order to provide a visualization of the monthly means. In Figure 3 it is easy to see that in April 2003 the test score average soared and did not fall below 4.24 for the remainder of the year. The April through December 2003 scores are substantially higher than the 2000 and 2001

April through December scores. This study could not conclusively determine the cause of the jump although there was a temporal association with change in sleep policy.

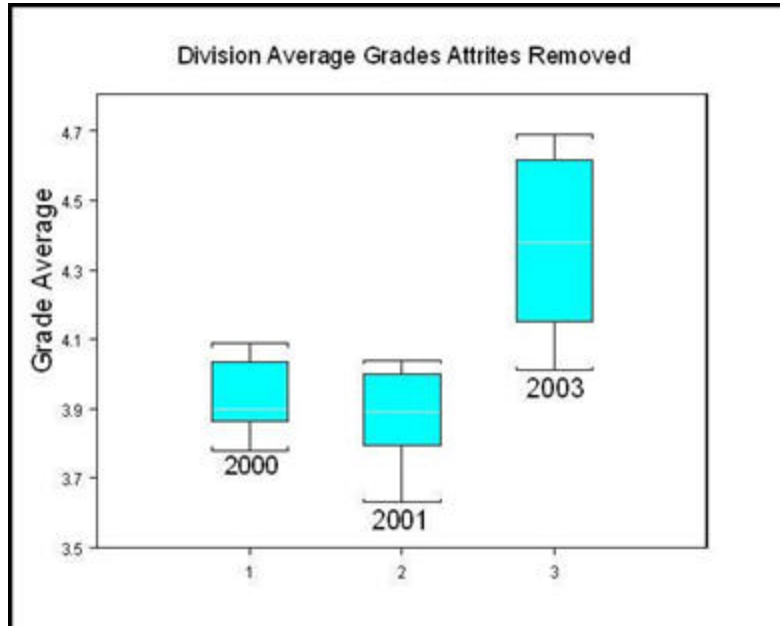


Figure 2. Division Average Grades Attrites Removed

AVGS WITH ATTRITES REMOVED			
Division Test Score AVG			
Month	2000	2001	2003
Jan	4.06	4.01	4.06
Feb	4.07	3.96	4.01
Mar	4.09	3.85	4.05
Apr	3.88	3.99	4.37
May	4.01	3.83	4.44
Jun	3.89	3.78	4.66
Jul	3.99	4.02	4.39
Aug	3.85	4.04	4.24
Sep	3.88	3.78	4.36
Oct	3.78	3.81	4.57
Nov	3.91	3.63	4.69
Dec	3.81	3.93	4.67
Year Average	3.94	3.89	4.38

Table 3. Division Test Score Averages by Month with Attrites Removed

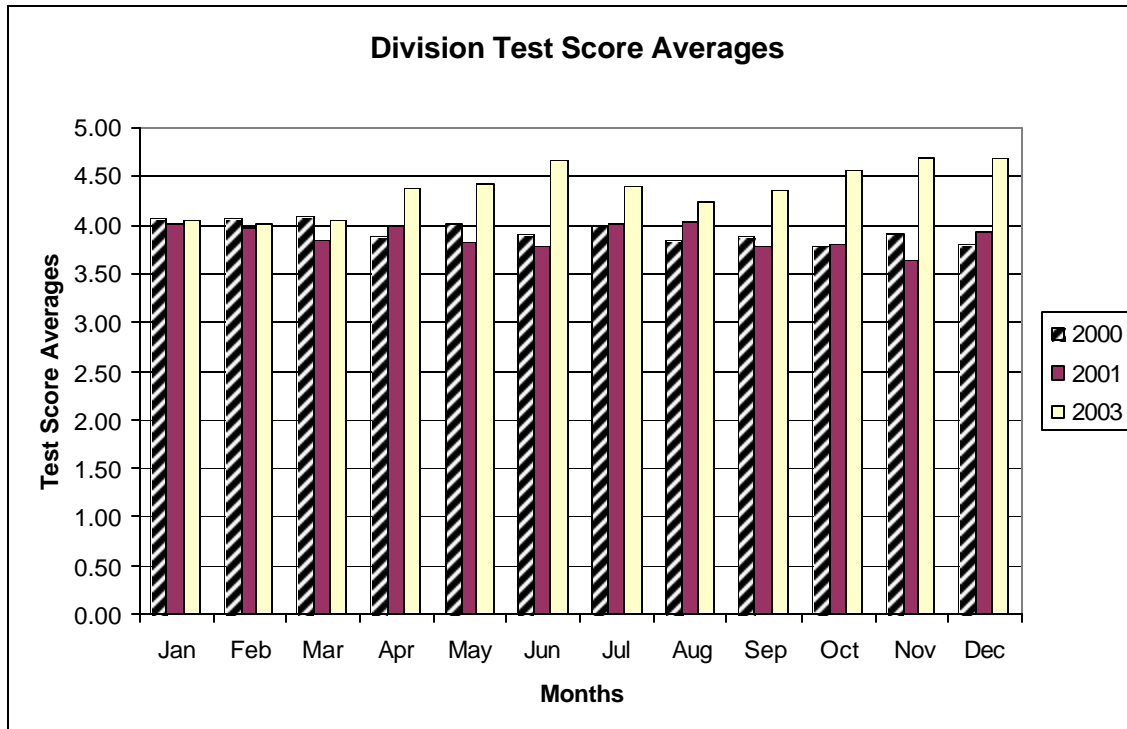


Figure 3. Division Mean Test Scores by Month

	I=	3	years
	J=	12	months
	Mean	SD	SD^2
2000	3.94	0.11	0.01
2001	3.89	0.13	0.02
2003	4.38	0.25	0.06
Grand Mean2	4.07		
MSTr2	0.87103		
MSE2	0.02921		
Fstat	29.81633		
pvalue	0.000000040		
FINV(.01,2,33)	5.31203		
Q(.01,3,33)	4.42267		
Tukey w	0.21821		

Table 4. Multiple Comparison ANOVA Tukey's Procedure for Test Scores

C. MULTIPLE COMPARISONS ANOVA FOR ASVAB SCORES

A multiple comparison ANOVA for ASVAB scores was computed to verify that there is not a significantly higher or lower ASVAB scores for Recruits being sampled in different years. Table 5 contains the results that were computed as described in Table 4 with the exception of the critical level, which was changed to .10. A significance level of .10 was chosen to reduce the chance of not rejecting the null hypothesis; all division ASVAB score averages are equal, when it is false. Using S-PLUS, the $Q_{\alpha,m,v}$ value was obtained by the command `qtukey(.90,3,33)`. While Figure 4 shows the ASVAB scores in 2003 are slightly higher, the difference computed in Table 5 does not show a significant difference at critical level .10. That is, the differences are consistent with what we would expect to see by chance: i.e., the populations are indistinguishable from a statistical sense.

	I=	3	years
	J=	12	months
	Mean	SD	SD^2
2000	57.09	3.30	10.92
2001	58.97	3.97	15.78
2003	60.14	4.26	18.16
Grand Mean	58.74		
MSTr	28.35381		
MSE	14.95190		
Fstat	1.89634		
pvalue	0.16612		
FINV(.10,2,33)	2.47099		
Q(.10,3,33)	3.00649		
Tukey w	3.35596		

AVERAGE AFQT PERCENTILE			
Division Test Score AVG			
Month	2000	2001	2003
Jan	63.0	64.1	59.8
Feb	59.2	58.1	55.8
Mar	59.6	61.6	59.5
Apr	54.4	61.8	57.8
May	60.3	63.5	67.7
Jun	52.2	55.2	56.3
Jul	58.4	55.2	57.8
Aug	58.1	57.6	57.0
Sep	53.5	57.2	62.4
Oct	54.4	55.0	55.9
Nov	58.1	53.6	66.2
Dec	54.1	64.7	65.4

Table 5. Multiple Comparison ANOVA Tukey's Procedure for ASVAB Scores

Figure 4 is the box plots of ASVAB data for the respective years. It is easy to visualize that the range of ASVAB scores from the three years overlap and the means are approximately equal. The data for these box plots was taken from Table 5.

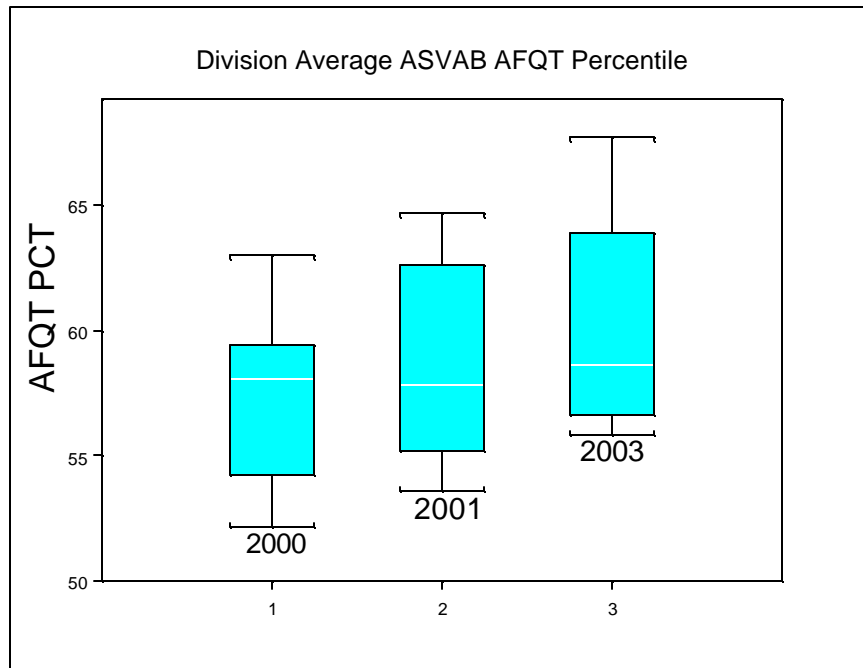


Figure 4. Division Average ASVAB Percentile Score

D. REGRESSION ANALYSIS

In addition to the multiple comparison analysis, linear regression was done to test for a relationship between amount of sleep and test scores of an individual. The test score is the dependent variable with ASVAB Score, year, and month as the independent variables. The ASVAB scores and month are included to account for potential differences in the Recruits under the different sleep policies. Year and month are categorical variables and ASVAB Scores is a numerical variable.

The data were entered into S-Plus to conduct the regression analysis. The linear regression model displayed in equation 4.6 provides the best fit. Figure 5 shows that the residuals do not exhibit excessive heteroscedasticity and the quantiles plot of residuals against the Standard Normal shows that the residuals follow a normal distribution.

$$\begin{aligned}
\text{TestScore} = & +3.3563 + (.0105)\text{AFQTPCT} - (.0404)\text{MonthAug} \\
& + (.0218)\text{MonthDec} - (.0720)\text{MonthFeb} - (.0830)\text{MonthJan} \\
& + (.0691)\text{MonthJul} + (.0453)\text{MonthJun} - (.0758)\text{MonthMar} \quad (4.6) \\
& - (.0571)\text{MonthMay} - (.0223)\text{MonthNov} + (.0110)\text{MonthOct} \\
& - (.0775)\text{MonthSep} - (.0651)\text{Year2001} + (.4263)\text{Year2003}
\end{aligned}$$

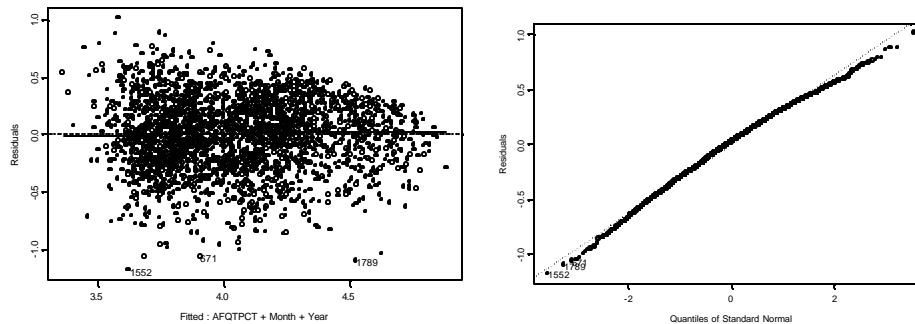


Figure 5. Residual and Quantiles of Standard Normal Plots

Table 6 shows the different coefficients that were output from the linear model in S-Plus. This table clearly points out that the model is dominated by the coefficients for Year2003 and AFQTPCT. The t value for each of these coefficients is much larger than any other t values. The AFQTPCT is known to be a significant factor in predicting test scores and Table 6 allows us to see that Year 2003 is nearly as important. In addition to Table 6, the model produced the following results:

Residual standard error: 0.3115 on 2581 degrees of freedom

Multiple R-Squared: 0.489

F-statistic: 176.4 on 14 and 2581 degrees of freedom, the p-value was 0

These results indicate that the ASVAB Score, year, and month have a significant impact on predicting the

individual test score averages. It is also noted that the impact of month is the smallest of the three variables. This linear model also accounted for approximately 49 percent of the total Test Score variance.

A stepwise regression was conducted using the STEPAIC function in S-PLUS. The stepwise regression did not improve the results and the simple linear regression model is our best regression model for the data.

Coefficients	Value	Std.Error	t value	Pr(> t)
(Intercept)	3.3563	0.0298	112.6257	0.0000
AFQTPCT	0.0105	0.0003	32.4945	0.0000
MonthAug	-0.0404	0.0297	-1.3580	0.1746
MonthDec	0.0218	0.0303	0.7180	0.4728
MonthFeb	-0.0720	0.0323	-2.2275	0.0260
MonthJan	-0.0830	0.0308	-2.6942	0.0071
MonthJul	0.0691	0.0300	2.3006	0.0215
MonthJun	0.0453	0.0304	1.4915	0.1359
MonthMar	-0.0758	0.0309	-2.4531	0.0142
MonthMay	-0.0571	0.0318	-1.7989	0.0722
MonthNov	-0.0223	0.0299	-0.7446	0.4566
MonthOct	0.0110	0.0298	0.3688	0.7123
MonthSep	-0.0775	0.0302	-2.5625	0.0104
Year2001	-0.0651	0.0149	-4.3823	0.0000
Year2003	0.4263	0.0153	27.8911	0.0000

Table 6. Summary of Linear Regression Coefficients

The model was also checked for multi-collinearity. Multi-collinearity is the linear relationship between two or more independent variables. Multi-collinearity was assumed to exist between the coefficients if the correlation was greater than .7 (Hamilton, 1992). As seen in Table 7 Multi-collinearity did not exist within this model.

Correlation of Coefficients							
	(Intercept)	AFQTPCT	MonthAug	MonthDec	MonthFeb	MonthJan	MonthJul
AFQTPCT	-0.6101						
MonthAug	-0.5488	0.0045					
MonthDec	-0.5115	-0.0362	0.5355				
MonthFeb	-0.4961	0.0053	0.5023	0.4926			
MonthJan	-0.4972	-0.0453	0.5269	0.5185	0.4847		
MonthJul	-0.5511	0.0138	0.5408	0.5297	0.4973	0.5213	
MonthJun	-0.5548	0.0363	0.5349	0.5232	0.4925	0.5146	0.5305
MonthMar	-0.5158	-0.0258	0.5253	0.5160	0.4825	0.5081	0.5204
MonthMay	-0.4694	-0.0596	0.5110	0.5036	0.4706	0.4963	0.5055
MonthNov	-0.5325	-0.0131	0.5425	0.5325	0.4991	0.5242	0.5370
MonthOct	-0.5580	0.0324	0.5459	0.5341	0.5029	0.5254	0.5406
MonthSep	-0.5319	0.0019	0.5368	0.5265	0.4945	0.5182	0.5318
Year2001	-0.2293	-0.0357	0.0058	0.0000	-0.0294	-0.0030	-0.0012
Year2003	-0.2114	-0.0660	0.0003	-0.0012	-0.0216	0.0018	0.0185
	MonthJun	MonthMar	MonthMay	MonthNov	MonthOct	MonthSep	Year2001
AFQTPCT							
MonthAug							
MonthDec							
MonthFeb							
MonthJan							
MonthJul							
MonthJun							
MonthMar	0.5139						
MonthMay	0.4989	0.4932					
MonthNov	0.5309	0.5221	0.5088				
MonthOct	0.5357	0.5236	0.5094	0.5418			
MonthSep	0.5264	0.5163	0.5030	0.5334	0.5370		
Year2001	-0.0164	0.0144	-0.0154	-0.0029	-0.0192	-0.0230	
Year2003	0.0066	0.0327	-0.0048	-0.0006	-0.0215	-0.0069	0.5076

Table 7. Correlation of Coefficients Matrix

E. SUMMARY OF STATISTICAL RESULTS

Both the multiple comparisons ANOVA and the regression analysis indicate significant differences between years. During 2003, when recruits were receiving more sleep, this difference had a large positive effect on test scores. The test scores were significantly higher in 2003 while the ASVAB scores were not significantly higher or lower in any of the years sampled. Although increased sleep was not necessarily the sole determinant of increased Recruit test performance, it was almost certainly a contributing factor. It is important to also note that over this same time

period, Recruits received new dormitories (Ships) with increased ventilation, were issued improved boots, had their scheduled optimized to decrease exposure time to inclement weather, and established a new physical training program. These were a few of the other variables that may have contributed to the higher test scores.

In conclusion, Recruits are getting more sleep and as a result have increased their test performance. It would be beneficial for the naval leadership to maintain the 8-hour sleep regimen.

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V. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE WORK

A. CONCLUSIONS

The results of this thesis demonstrate that there are significant differences in the test scores of Recruits when comparing the years 2000, 2001, and 2003. While the change in sleep regimen that took place in 2002 is a significant contributor to the higher test scores it can not be singled out as the sole contributor. Over this same time period, Recruits received new dormitories (Ships) with increased ventilation, were issued improved boots, had their scheduled optimized to decrease exposure time to inclement weather, and established a new physical training program. These were a few of the other variables that may have contributed to the higher test scores. Nonetheless, there is strong evidence that the altered sleep regimen is associated with the dramatic improvement in test scores. These findings are in line with the preponderance of scientific literature which demonstrates the importance of sleep in learning and memory. The change in sleep regimen and other variables made by the leadership at Naval Service Training Command are improving the Recruit quality of life and producing a better trained and smarter Recruit. It is strongly recommended that the eight hour regimen be adopted permanently and that these findings are prominently circulated throughout the naval community.

B. RECOMMENDATIONS FOR FUTURE WORK

Further studies incorporating more variables need to be conducted to confirm positive changes made at Naval Service Training Command. Rather than using a sample of

the population, the data from the entire population of Recruits (approximately 150,000 in total) should be used. While this effort would have taken substantially longer to collect and analyze the data, it is vital that this effort should be undertaken in order to validate the findings for the entire population of Recruits.

Safety incidents extracted from sick call data should be studied in conjunction with this study to compare the safety rates to years in which less sleep was given. The Medical Department has the data, but with an already short staff it would be difficult to obligate personnel for data extraction. A medical representative capable of extracting the data would need to be arranged prior to a thesis student's experience tour. For this thesis, the Safety Officer was unable to provide the information because the data from 2000 were not kept on file in the safety office. Additionally, the safety data collected on recruits during 2003 were different than in 2000 and 2001. In 2003, the Safety Officer collected data during Battle Stations, Confidence Course, Pool Training, Firefighting, and Physical Training. Safety data are constantly being scrutinized for trends and if a problem area is identified, the Safety Officer corrects it, thereby impacting future safety statistics. A multiple comparisons ANOVA and linear regression might be used to identify significant differences.

Since fatigue has been linked to upper respiratory illnesses (URIs) and common colds, the Medical Department could provide these data. It is strongly recommended that Medical personnel be included on this data analysis team.

APPENDIX A. REGRESSION ANALYSIS DATA

Test Avg	AFQT %	Month	Year
4.15	83	Jan	2000
3.78	40	Jan	2000
4.15	40	Jan	2000
4.03	40	Jan	2000
3.90	35	Jan	2000
4.68	95	Jan	2000
4.13	84	Jan	2000
4.38	92	Jan	2000
4.28	67	Jan	2000
4.23	35	Jan	2000
4.35	53	Jan	2000
4.30	74	Jan	2000
4.10	78	Jan	2000
4.33	74	Jan	2000
3.65	46	Jan	2000
3.83	71	Jan	2000
3.63	33	Jan	2000
4.60	99	Jan	2000
4.28	46	Jan	2000
3.33	41	Jan	2000
3.63	40	Jan	2000
4.18	52	Jan	2000
3.50	35	Jan	2000
4.25	84	Jan	2000
3.90	38	Jan	2000
4.18	54	Jan	2000
4.05	63	Jan	2000
3.80	52	Jan	2000
4.13	74	Jan	2000
3.93	56	Jan	2000
4.60	99	Jan	2000
4.00	35	Jan	2000
4.20	75	Jan	2000
4.23	89	Jan	2000
3.93	42	Jan	2000
3.65	50	Jan	2000
4.53	88	Jan	2000
3.68	45	Jan	2000
4.38	94	Jan	2000
4.28	37	Jan	2000
4.13	84	Jan	2000
4.48	81	Jan	2000
3.95	67	Jan	2000
3.88	53	Jan	2000
4.05	58	Jan	2000

Test Avg	AFQT %	Month	Year
4.40	75	Jan	2000
4.18	68	Jan	2000
3.85	96	Jan	2000
3.43	58	Jan	2000
3.83	73	Jan	2000
4.33	42	Jan	2000
4.48	97	Jan	2000
4.65	95	Jan	2000
4.35	45	Jan	2000
3.88	61	Jan	2000
3.90	38	Jan	2000
3.63	42	Jan	2000
4.53	85	Jan	2000
3.55	54	Jan	2000
3.93	69	Jan	2000
4.15	63	Jan	2000
3.75	68	Jan	2000
3.75	67	Jan	2000
3.83	57	Jan	2000
4.48	82	Jan	2000
3.90	40	Jan	2000
3.78	53	Jan	2000
4.38	85	Jan	2000
3.80	62	Jan	2000
3.60	40	Feb	2000
3.93	41	Feb	2000
4.40	76	Feb	2000
4.50	74	Feb	2000
3.38	33	Feb	2000
4.40	85	Feb	2000
4.50	85	Feb	2000
4.33	56	Feb	2000
4.45	76	Feb	2000
4.18	65	Feb	2000
4.08	51	Feb	2000
3.70	42	Feb	2000
3.98	40	Feb	2000
3.55	33	Feb	2000
4.23	84	Feb	2000
3.78	72	Feb	2000
4.08	53	Feb	2000
3.95	43	Feb	2000
4.20	32	Feb	2000
4.00	49	Feb	2000
3.58	32	Feb	2000
4.60	70	Feb	2000
4.60	82	Feb	2000
3.93	36	Feb	2000
4.05	65	Feb	2000

Test Avg	AFQT %	Month	Year
4.20	77	Feb	2000
3.80	57	Feb	2000
4.13	88	Feb	2000
3.60	42	Feb	2000
4.15	76	Feb	2000
3.93	58	Feb	2000
4.23	38	Feb	2000
3.60	51	Feb	2000
4.08	44	Feb	2000
4.60	79	Feb	2000
4.58	85	Feb	2000
3.55	48	Feb	2000
4.48	94	Feb	2000
3.48	75	Feb	2000
4.15	76	Feb	2000
3.53	38	Feb	2000
4.18	32	Feb	2000
4.55	73	Feb	2000
4.45	76	Feb	2000
3.70	32	Feb	2000
4.53	69	Feb	2000
4.15	80	Mar	2000
4.73	95	Mar	2000
3.55	39	Mar	2000
4.38	55	Mar	2000
4.25	42	Mar	2000
3.90	46	Mar	2000
3.40	34	Mar	2000
3.55	31	Mar	2000
4.50	84	Mar	2000
4.05	35	Mar	2000
4.23	47	Mar	2000
4.50	70	Mar	2000
4.20	37	Mar	2000
4.33	67	Mar	2000
4.60	95	Mar	2000
4.53	77	Mar	2000
4.10	77	Mar	2000
4.23	45	Mar	2000
4.25	56	Mar	2000
3.95	49	Mar	2000
4.15	67	Mar	2000
4.30	98	Mar	2000
4.05	72	Mar	2000
3.48	34	Mar	2000
3.78	41	Mar	2000
3.53	32	Mar	2000
4.23	44	Mar	2000
3.23	36	Mar	2000

Test Avg	AFQT %	Month	Year
4.35	88	Mar	2000
4.38	87	Mar	2000
3.98	51	Mar	2000
3.85	51	Mar	2000
4.08	36	Mar	2000
4.20	84	Mar	2000
4.23	73	Mar	2000
4.48	92	Mar	2000
4.53	95	Mar	2000
4.15	43	Mar	2000
4.40	99	Mar	2000
3.75	38	Mar	2000
4.08	40	Mar	2000
4.10	49	Mar	2000
4.23	48	Mar	2000
3.98	31	Mar	2000
4.65	75	Mar	2000
4.38	83	Mar	2000
3.78	32	Mar	2000
4.03	53	Mar	2000
4.75	97	Mar	2000
3.53	44	Mar	2000
3.43	36	Mar	2000
4.28	81	Mar	2000
4.10	51	Mar	2000
4.60	70	Mar	2000
4.43	66	Mar	2000
3.70	37	Mar	2000
4.18	81	Mar	2000
3.95	49	Mar	2000
3.83	32	Mar	2000
4.53	99	Mar	2000
3.45	54	Mar	2000
4.40	86	Mar	2000
4.30	92	Mar	2000
3.60	34	Mar	2000
4.23	78	Mar	2000
4.53	91	Mar	2000
3.48	38	Mar	2000
4.63	99	Mar	2000
4.63	47	Mar	2000
3.98	82	Mar	2000
3.75	42	Mar	2000
3.75	40	Mar	2000
3.85	34	Mar	2000
4.25	59	Mar	2000
3.58	33	Mar	2000
4.03	62	Mar	2000
4.00	51	Mar	2000

Test Avg	AFQT %	Month	Year
4.53	89	Mar	2000
3.45	39	Mar	2000
4.48	42	Mar	2000
4.58	85	Mar	2000
3.40	32	Mar	2000
3.73	36	Apr	2000
3.48	66	Apr	2000
3.35	42	Apr	2000
4.70	99	Apr	2000
3.48	39	Apr	2000
3.85	34	Apr	2000
4.25	44	Apr	2000
4.10	47	Apr	2000
4.20	99	Apr	2000
3.60	46	Apr	2000
3.55	42	Apr	2000
4.05	55	Apr	2000
3.65	55	Apr	2000
3.30	36	Apr	2000
4.55	79	Apr	2000
4.08	37	Apr	2000
4.25	93	Apr	2000
3.98	35	Apr	2000
3.90	33	Apr	2000
3.55	56	Apr	2000
3.78	55	Apr	2000
4.05	35	Apr	2000
4.05	86	Apr	2000
4.43	77	Apr	2000
4.18	61	Apr	2000
3.73	36	Apr	2000
4.40	87	Apr	2000
3.68	44	Apr	2000
3.58	55	Apr	2000
3.78	58	Apr	2000
4.10	71	Apr	2000
3.55	59	Apr	2000
3.60	37	Apr	2000
4.15	65	Apr	2000
3.28	38	Apr	2000
4.05	33	Apr	2000
4.35	56	Apr	2000
3.80	38	Apr	2000
3.95	51	Apr	2000
3.60	57	Apr	2000
3.20	33	Apr	2000
3.83	63	Apr	2000
4.05	81	Apr	2000
3.75	42	Apr	2000

Test Avg	AFQT %	Month	Year
3.70	43	Apr	2000
3.48	47	Apr	2000
3.68	52	Apr	2000
4.05	53	Apr	2000
3.78	63	Apr	2000
3.83	42	Apr	2000
4.23	45	Apr	2000
4.28	86	Apr	2000
3.75	32	Apr	2000
4.55	50	Apr	2000
3.58	42	Apr	2000
3.60	57	Apr	2000
3.78	62	Apr	2000
3.58	34	Apr	2000
3.45	33	Apr	2000
4.20	97	Apr	2000
4.23	66	Apr	2000
3.95	42	Apr	2000
3.38	74	Apr	2000
4.23	58	Apr	2000
4.58	64	Apr	2000
3.90	41	Apr	2000
3.68	52	Apr	2000
4.30	70	Apr	2000
3.65	32	May	2000
3.30	37	May	2000
3.95	63	May	2000
4.03	33	May	2000
4.43	73	May	2000
3.90	58	May	2000
4.10	77	May	2000
3.83	78	May	2000
3.85	48	May	2000
3.63	39	May	2000
3.75	72	May	2000
4.38	62	May	2000
3.55	50	May	2000
4.78	87	May	2000
4.45	88	May	2000
3.90	77	May	2000
4.33	47	May	2000
4.25	43	May	2000
4.05	79	May	2000
3.48	42	May	2000
4.45	94	May	2000
4.28	93	May	2000
4.53	67	May	2000
4.28	58	May	2000
3.40	42	May	2000

Test Avg	AFQT %	Month	Year
4.43	88	May	2000
4.55	64	May	2000
4.53	99	May	2000
4.10	37	May	2000
4.23	69	May	2000
4.68	96	May	2000
3.68	35	May	2000
4.18	47	May	2000
3.80	69	May	2000
4.25	56	May	2000
3.85	79	May	2000
3.55	45	May	2000
3.38	47	May	2000
4.63	93	May	2000
3.73	53	May	2000
4.10	69	May	2000
4.43	66	May	2000
4.03	74	May	2000
4.05	53	May	2000
3.65	41	May	2000
3.78	39	May	2000
3.63	32	May	2000
4.33	55	May	2000
3.55	61	May	2000
3.90	71	May	2000
3.50	58	May	2000
4.18	54	May	2000
4.08	69	May	2000
3.90	42	May	2000
3.63	31	May	2000
4.10	45	May	2000
4.38	64	Jun	2000
3.60	42	Jun	2000
3.88	61	Jun	2000
3.68	42	Jun	2000
4.55	83	Jun	2000
4.15	69	Jun	2000
4.23	35	Jun	2000
3.55	34	Jun	2000
3.98	43	Jun	2000
4.00	43	Jun	2000
3.75	32	Jun	2000
3.65	35	Jun	2000
4.05	59	Jun	2000
4.30	63	Jun	2000
4.53	68	Jun	2000
4.28	44	Jun	2000
3.83	46	Jun	2000
3.85	32	Jun	2000

Test Avg	AFQT %	Month	Year
3.40	31	Jun	2000
3.68	52	Jun	2000
3.48	34	Jun	2000
3.78	43	Jun	2000
3.85	49	Jun	2000
3.30	35	Jun	2000
3.83	49	Jun	2000
3.80	66	Jun	2000
4.13	44	Jun	2000
4.15	71	Jun	2000
3.88	46	Jun	2000
3.98	44	Jun	2000
4.05	35	Jun	2000
4.00	94	Jun	2000
3.65	52	Jun	2000
3.65	42	Jun	2000
3.95	49	Jun	2000
3.68	37	Jun	2000
4.08	71	Jun	2000
3.95	69	Jun	2000
3.73	54	Jun	2000
3.63	36	Jun	2000
4.35	80	Jun	2000
3.55	81	Jun	2000
3.33	35	Jun	2000
3.68	49	Jun	2000
4.00	53	Jun	2000
3.68	38	Jun	2000
4.13	87	Jun	2000
3.68	73	Jun	2000
4.28	70	Jun	2000
3.98	44	Jun	2000
3.93	45	Jun	2000
3.70	73	Jun	2000
4.03	48	Jun	2000
4.00	49	Jun	2000
3.95	32	Jun	2000
3.65	54	Jun	2000
3.75	51	Jun	2000
3.65	31	Jun	2000
3.75	33	Jun	2000
3.90	71	Jun	2000
4.18	40	Jun	2000
4.13	66	Jun	2000
3.70	47	Jun	2000
4.38	74	Jun	2000
4.35	90	Jun	2000
4.08	53	Jun	2000
3.60	49	Jun	2000

Test Avg	AFQT %	Month	Year
3.23	37	Jun	2000
3.83	53	Jun	2000
3.93	35	Jun	2000
4.28	64	Jun	2000
3.98	35	Jun	2000
3.83	70	Jun	2000
4.33	81	Jul	2000
3.93	64	Jul	2000
3.45	32	Jul	2000
3.93	42	Jul	2000
3.88	37	Jul	2000
4.18	58	Jul	2000
4.58	70	Jul	2000
3.83	47	Jul	2000
4.48	88	Jul	2000
4.40	82	Jul	2000
4.10	35	Jul	2000
4.40	63	Jul	2000
4.08	69	Jul	2000
3.63	42	Jul	2000
4.00	59	Jul	2000
4.23	42	Jul	2000
3.80	44	Jul	2000
3.45	37	Jul	2000
3.50	62	Jul	2000
3.73	35	Jul	2000
4.15	76	Jul	2000
3.10	42	Jul	2000
4.68	94	Jul	2000
4.68	86	Jul	2000
3.60	32	Jul	2000
4.38	83	Jul	2000
4.35	55	Jul	2000
4.55	89	Jul	2000
3.68	66	Jul	2000
4.08	42	Jul	2000
4.23	73	Jul	2000
3.75	42	Jul	2000
4.33	84	Jul	2000
3.95	75	Jul	2000
3.90	42	Jul	2000
3.93	72	Jul	2000
4.58	68	Jul	2000
3.93	53	Jul	2000
4.28	55	Jul	2000
3.55	42	Jul	2000
3.25	48	Jul	2000
3.95	32	Jul	2000
4.05	44	Jul	2000

Test Avg	AFQT %	Month	Year
4.05	77	Jul	2000
4.33	64	Jul	2000
4.33	84	Jul	2000
4.30	66	Jul	2000
3.58	61	Jul	2000
3.45	49	Jul	2000
4.10	51	Jul	2000
4.60	89	Jul	2000
3.33	32	Jul	2000
3.58	69	Jul	2000
4.08	51	Jul	2000
4.30	78	Jul	2000
3.63	36	Jul	2000
4.43	95	Jul	2000
3.73	51	Jul	2000
4.08	53	Jul	2000
3.88	35	Jul	2000
3.90	37	Jul	2000
3.95	67	Jul	2000
3.43	41	Jul	2000
4.25	83	Jul	2000
3.98	43	Jul	2000
4.13	42	Jul	2000
3.78	76	Jul	2000
3.53	47	Jul	2000
3.50	36	Jul	2000
3.50	33	Jul	2000
4.35	68	Jul	2000
3.93	65	Jul	2000
4.15	63	Jul	2000
4.35	76	Jul	2000
3.18	44	Jul	2000
4.53	85	Jul	2000
3.58	45	Jul	2000
4.13	69	Jul	2000
4.03	84	Jul	2000
4.50	97	Jul	2000
3.75	42	Jul	2000
4.15	40	Jul	2000
3.95	54	Jul	2000
4.18	41	Jul	2000
3.88	45	Aug	2000
3.60	31	Aug	2000
3.83	52	Aug	2000
3.35	39	Aug	2000
3.68	74	Aug	2000
3.55	59	Aug	2000
4.08	55	Aug	2000
4.08	76	Aug	2000

Test Avg	AFQT %	Month	Year
3.53	38	Aug	2000
3.30	73	Aug	2000
3.68	47	Aug	2000
3.55	43	Aug	2000
3.90	40	Aug	2000
4.35	89	Aug	2000
3.05	33	Aug	2000
3.53	45	Aug	2000
3.50	57	Aug	2000
3.38	47	Aug	2000
4.05	75	Aug	2000
4.10	59	Aug	2000
3.25	43	Aug	2000
3.90	95	Aug	2000
4.10	98	Aug	2000
4.13	76	Aug	2000
3.70	33	Aug	2000
4.48	99	Aug	2000
3.65	51	Aug	2000
3.13	33	Aug	2000
3.88	53	Aug	2000
3.70	45	Aug	2000
4.00	63	Aug	2000
4.28	87	Aug	2000
3.78	53	Aug	2000
3.75	35	Aug	2000
3.95	78	Aug	2000
4.23	61	Aug	2000
4.08	80	Aug	2000
3.88	32	Aug	2000
3.50	53	Aug	2000
3.50	41	Aug	2000
3.68	38	Aug	2000
4.03	48	Aug	2000
3.75	58	Aug	2000
4.28	39	Aug	2000
3.53	67	Aug	2000
3.88	82	Aug	2000
3.58	42	Aug	2000
3.93	62	Aug	2000
3.33	45	Aug	2000
3.65	71	Aug	2000
4.25	57	Aug	2000
4.38	78	Aug	2000
3.90	54	Aug	2000
3.60	35	Aug	2000
4.18	84	Aug	2000
4.28	75	Aug	2000
3.38	32	Aug	2000

Test Avg	AFQT %	Month	Year
4.08	77	Aug	2000
3.75	42	Aug	2000
3.65	33	Aug	2000
3.80	59	Aug	2000
4.00	61	Aug	2000
4.45	78	Aug	2000
4.58	93	Aug	2000
4.55	99	Aug	2000
3.88	46	Aug	2000
3.70	43	Aug	2000
3.85	68	Aug	2000
4.43	78	Aug	2000
3.35	32	Aug	2000
4.13	67	Aug	2000
4.40	71	Aug	2000
4.18	83	Aug	2000
4.40	63	Aug	2000
4.15	68	Aug	2000
3.55	52	Aug	2000
3.88	51	Aug	2000
4.15	63	Aug	2000
3.15	32	Aug	2000
4.23	59	Aug	2000
3.78	49	Aug	2000
2.98	43	Aug	2000
4.05	82	Aug	2000
3.78	36	Aug	2000
3.78	35	Sep	2000
3.60	42	Sep	2000
3.95	48	Sep	2000
4.30	69	Sep	2000
3.78	33	Sep	2000
3.28	33	Sep	2000
3.88	58	Sep	2000
3.55	35	Sep	2000
3.48	49	Sep	2000
3.48	40	Sep	2000
3.65	35	Sep	2000
4.10	51	Sep	2000
3.95	37	Sep	2000
3.28	45	Sep	2000
3.83	58	Sep	2000
3.73	54	Sep	2000
4.40	84	Sep	2000
4.05	58	Sep	2000
3.30	31	Sep	2000
3.28	35	Sep	2000
3.58	47	Sep	2000
4.30	84	Sep	2000

Test Avg	AFQT %	Month	Year
4.08	71	Sep	2000
3.63	67	Sep	2000
4.00	73	Sep	2000
3.78	51	Sep	2000
3.53	35	Sep	2000
3.83	32	Sep	2000
3.30	33	Sep	2000
4.33	77	Sep	2000
3.70	73	Sep	2000
3.45	32	Sep	2000
3.85	49	Sep	2000
4.45	99	Sep	2000
4.48	76	Sep	2000
3.60	36	Sep	2000
4.05	57	Sep	2000
4.05	36	Sep	2000
3.78	33	Sep	2000
4.38	65	Sep	2000
3.88	42	Sep	2000
3.28	35	Sep	2000
4.55	80	Sep	2000
4.33	86	Sep	2000
3.25	36	Sep	2000
4.20	74	Sep	2000
4.25	45	Sep	2000
4.25	74	Sep	2000
4.60	77	Sep	2000
3.88	47	Sep	2000
3.98	40	Sep	2000
4.50	97	Sep	2000
3.90	65	Sep	2000
3.90	51	Sep	2000
4.15	54	Sep	2000
4.30	93	Sep	2000
4.18	45	Sep	2000
3.78	55	Sep	2000
3.95	54	Sep	2000
3.68	70	Sep	2000
4.48	78	Sep	2000
3.68	42	Sep	2000
4.03	31	Sep	2000
3.53	49	Sep	2000
3.63	33	Sep	2000
3.33	38	Sep	2000
3.70	39	Sep	2000
4.30	85	Oct	2000
3.38	42	Oct	2000
4.28	70	Oct	2000
3.95	61	Oct	2000

Test Avg	AFQT %	Month	Year
3.68	50	Oct	2000
4.10	76	Oct	2000
3.70	39	Oct	2000
4.25	81	Oct	2000
3.95	53	Oct	2000
4.43	69	Oct	2000
3.23	44	Oct	2000
4.15	69	Oct	2000
3.83	51	Oct	2000
3.18	31	Oct	2000
4.15	39	Oct	2000
3.98	70	Oct	2000
3.53	43	Oct	2000
3.73	50	Oct	2000
3.60	50	Oct	2000
4.18	95	Oct	2000
3.93	32	Oct	2000
4.03	41	Oct	2000
3.68	34	Oct	2000
3.60	33	Oct	2000
4.35	80	Oct	2000
3.43	31	Oct	2000
4.15	46	Oct	2000
3.58	50	Oct	2000
3.90	32	Oct	2000
4.05	89	Oct	2000
3.25	36	Oct	2000
4.40	95	Oct	2000
3.65	52	Oct	2000
3.93	68	Oct	2000
3.50	65	Oct	2000
4.00	42	Oct	2000
4.78	99	Oct	2000
3.58	42	Oct	2000
4.08	88	Oct	2000
3.90	61	Oct	2000
3.88	38	Oct	2000
2.85	52	Oct	2000
3.43	36	Oct	2000
3.23	34	Oct	2000
3.05	31	Oct	2000
3.88	71	Oct	2000
4.13	44	Oct	2000
3.70	35	Oct	2000
3.73	55	Oct	2000
3.53	42	Oct	2000
3.98	51	Oct	2000
3.85	64	Oct	2000
3.53	31	Oct	2000

Test Avg	AFQT %	Month	Year
3.80	65	Oct	2000
4.50	77	Oct	2000
4.23	84	Oct	2000
3.60	65	Oct	2000
3.58	33	Oct	2000
4.10	63	Oct	2000
2.80	37	Oct	2000
3.85	57	Oct	2000
3.00	31	Oct	2000
3.80	87	Oct	2000
3.33	33	Oct	2000
3.68	62	Oct	2000
3.50	71	Oct	2000
2.98	32	Oct	2000
3.50	34	Oct	2000
3.95	73	Oct	2000
4.08	33	Oct	2000
4.35	82	Nov	2000
4.40	73	Nov	2000
3.18	45	Nov	2000
3.85	69	Nov	2000
4.00	64	Nov	2000
3.60	32	Nov	2000
4.23	54	Nov	2000
3.50	38	Nov	2000
4.40	94	Nov	2000
4.55	95	Nov	2000
3.58	38	Nov	2000
4.25	55	Nov	2000
4.18	53	Nov	2000
4.03	38	Nov	2000
3.43	39	Nov	2000
3.45	32	Nov	2000
4.08	65	Nov	2000
4.28	99	Nov	2000
4.33	53	Nov	2000
4.10	78	Nov	2000
4.20	69	Nov	2000
3.58	62	Nov	2000
3.83	41	Nov	2000
3.53	42	Nov	2000
3.95	51	Nov	2000
3.85	38	Nov	2000
3.83	68	Nov	2000
3.75	79	Nov	2000
4.18	71	Nov	2000
3.90	34	Nov	2000
3.88	59	Nov	2000
4.15	72	Nov	2000

Test Avg	AFQT %	Month	Year
3.70	32	Nov	2000
4.23	84	Nov	2000
4.28	96	Nov	2000
3.85	35	Nov	2000
4.30	47	Nov	2000
4.00	39	Nov	2000
3.55	42	Nov	2000
3.98	84	Nov	2000
3.95	55	Nov	2000
3.38	36	Nov	2000
4.00	47	Nov	2000
4.00	59	Nov	2000
3.90	54	Nov	2000
4.05	68	Nov	2000
3.50	32	Nov	2000
3.43	43	Nov	2000
3.68	34	Nov	2000
3.63	32	Nov	2000
4.23	52	Nov	2000
4.25	84	Nov	2000
4.35	80	Nov	2000
3.30	45	Nov	2000
3.58	41	Nov	2000
4.05	38	Nov	2000
3.68	86	Nov	2000
3.83	32	Nov	2000
4.10	44	Nov	2000
4.15	87	Nov	2000
3.95	75	Nov	2000
4.48	92	Nov	2000
3.35	34	Nov	2000
3.28	32	Nov	2000
3.70	63	Nov	2000
4.20	95	Nov	2000
4.18	52	Nov	2000
4.10	63	Nov	2000
3.90	61	Nov	2000
4.03	69	Nov	2000
3.98	70	Nov	2000
3.95	72	Nov	2000
3.48	75	Nov	2000
3.45	53	Nov	2000
3.88	34	Nov	2000
3.78	73	Nov	2000
3.40	32	Nov	2000
4.40	97	Nov	2000
4.00	59	Dec	2000
3.93	32	Dec	2000
3.75	53	Dec	2000

Test Avg	AFQT %	Month	Year
3.85	65	Dec	2000
4.13	89	Dec	2000
3.50	31	Dec	2000
3.80	36	Dec	2000
4.58	80	Dec	2000
3.98	35	Dec	2000
3.55	32	Dec	2000
3.93	76	Dec	2000
3.80	32	Dec	2000
3.88	36	Dec	2000
3.73	62	Dec	2000
3.70	65	Dec	2000
3.28	35	Dec	2000
4.05	53	Dec	2000
3.55	42	Dec	2000
3.95	42	Dec	2000
4.25	66	Dec	2000
3.60	41	Dec	2000
4.03	41	Dec	2000
3.75	1	Dec	2000
2.83	38	Dec	2000
3.63	52	Dec	2000
3.95	55	Dec	2000
3.63	70	Dec	2000
3.80	65	Dec	2000
3.28	34	Dec	2000
3.60	35	Dec	2000
3.35	37	Dec	2000
4.10	79	Dec	2000
3.28	37	Dec	2000
3.60	35	Dec	2000
4.28	77	Dec	2000
3.60	40	Dec	2000
4.20	64	Dec	2000
3.13	42	Dec	2000
3.30	72	Dec	2000
3.83	65	Dec	2000
4.08	57	Dec	2000
3.60	49	Dec	2000
4.10	41	Dec	2000
4.23	69	Dec	2000
4.15	84	Dec	2000
4.15	62	Dec	2000
4.18	49	Dec	2000
3.48	73	Dec	2000
3.68	71	Dec	2000
3.05	50	Dec	2000
3.35	40	Dec	2000
3.70	41	Dec	2000

Test Avg	AFQT %	Month	Year
4.05	69	Dec	2000
4.03	63	Dec	2000
4.23	77	Dec	2000
4.40	77	Dec	2000
3.40	24	Dec	2000
3.65	31	Dec	2000
4.48	99	Dec	2000
3.60	36	Dec	2000
3.60	38	Dec	2000
3.48	40	Dec	2000
4.03	45	Dec	2000
4.40	96	Dec	2000
4.23	73	Dec	2000
4.03	44	Dec	2000
3.85	68	Dec	2000
3.98	72	Dec	2000
3.58	46	Dec	2000
3.90	43	Dec	2000
4.13	71	Dec	2000
3.90	63	Dec	2000
4.13	74	Dec	2000
3.35	67	Dec	2000
3.93	65	Jan	2001
3.68	74	Jan	2001
3.63	32	Jan	2001
4.10	66	Jan	2001
3.38	32	Jan	2001
3.80	57	Jan	2001
3.60	59	Jan	2001
4.05	53	Jan	2001
4.30	89	Jan	2001
3.78	58	Jan	2001
3.33	42	Jan	2001
3.98	92	Jan	2001
3.65	65	Jan	2001
4.18	52	Jan	2001
4.25	92	Jan	2001
4.23	37	Jan	2001
4.25	78	Jan	2001
3.95	55	Jan	2001
4.00	63	Jan	2001
4.45	83	Jan	2001
3.88	71	Jan	2001
3.40	52	Jan	2001
3.15	65	Jan	2001
4.53	57	Jan	2001
4.18	80	Jan	2001
3.78	27	Jan	2001
4.23	81	Jan	2001

Test Avg	AFQT %	Month	Year
4.20	63	Jan	2001
3.73	32	Jan	2001
4.20	40	Jan	2001
3.80	70	Jan	2001
4.00	79	Jan	2001
3.95	77	Jan	2001
3.93	32	Jan	2001
4.45	71	Jan	2001
3.88	46	Jan	2001
4.33	99	Jan	2001
4.03	67	Jan	2001
4.03	44	Jan	2001
4.58	63	Jan	2001
3.50	43	Jan	2001
4.28	52	Jan	2001
4.43	84	Jan	2001
3.90	15	Jan	2001
3.75	77	Jan	2001
3.68	59	Jan	2001
3.80	93	Jan	2001
3.90	84	Jan	2001
3.88	53	Jan	2001
4.45	87	Jan	2001
4.08	53	Jan	2001
4.53	93	Jan	2001
3.70	70	Jan	2001
4.43	99	Jan	2001
3.95	77	Jan	2001
4.03	70	Jan	2001
3.58	53	Jan	2001
3.88	52	Jan	2001
4.63	99	Jan	2001
4.23	93	Jan	2001
3.78	52	Jan	2001
4.13	30	Jan	2001
4.23	81	Jan	2001
3.98	51	Jan	2001
4.50	90	Jan	2001
4.30	49	Jan	2001
3.80	47	Jan	2001
4.30	83	Jan	2001
4.13	65	Jan	2001
4.15	65	Jan	2001
3.95	63	Jan	2001
4.03	71	Jan	2001
4.60	35	Feb	2001
3.85	69	Feb	2001
4.00	92	Feb	2001
4.00	69	Feb	2001

Test Avg	AFQT %	Month	Year
3.85	64	Feb	2001
3.73	61	Feb	2001
3.40	42	Feb	2001
4.30	81	Feb	2001
4.25	94	Feb	2001
3.90	61	Feb	2001
3.53	35	Feb	2001
4.00	52	Feb	2001
3.58	45	Feb	2001
3.75	31	Feb	2001
4.13	55	Feb	2001
3.90	43	Feb	2001
4.33	99	Feb	2001
3.50	45	Feb	2001
4.35	52	Feb	2001
3.78	51	Feb	2001
3.75	78	Feb	2001
3.90	43	Feb	2001
3.93	57	Feb	2001
4.08	50	Feb	2001
4.35	99	Feb	2001
3.85	50	Feb	2001
4.00	81	Feb	2001
4.15	57	Feb	2001
3.60	57	Feb	2001
3.93	64	Feb	2001
3.83	51	Feb	2001
3.80	62	Feb	2001
4.10	57	Feb	2001
3.93	76	Feb	2001
4.23	88	Feb	2001
4.28	70	Feb	2001
4.23	53	Feb	2001
4.15	46	Feb	2001
4.43	42	Feb	2001
3.95	69	Feb	2001
4.38	82	Feb	2001
3.68	42	Feb	2001
3.85	33	Feb	2001
4.15	49	Feb	2001
3.70	39	Feb	2001
3.73	26	Feb	2001
4.25	98	Feb	2001
4.53	72	Feb	2001
4.08	87	Feb	2001
3.95	40	Feb	2001
3.33	32	Feb	2001
4.03	45	Feb	2001
3.38	44	Feb	2001

Test Avg	AFQT %	Month	Year
4.13	79	Feb	2001
3.85	31	Feb	2001
4.18	66	Feb	2001
3.55	29	Feb	2001
4.33	63	Feb	2001
3.98	90	Feb	2001
3.65	91	Feb	2001
3.53	42	Feb	2001
3.98	24	Feb	2001
4.45	86	Feb	2001
4.20	48	Feb	2001
3.48	18	Feb	2001
4.45	66	Feb	2001
3.80	47	Feb	2001
3.73	39	Mar	2001
4.30	87	Mar	2001
3.58	69	Mar	2001
4.00	75	Mar	2001
3.78	83	Mar	2001
3.85	56	Mar	2001
3.50	47	Mar	2001
3.78	98	Mar	2001
3.43	47	Mar	2001
4.05	27	Mar	2001
4.00	54	Mar	2001
3.85	56	Mar	2001
4.13	87	Mar	2001
3.88	69	Mar	2001
3.93	53	Mar	2001
4.35	56	Mar	2001
4.05	58	Mar	2001
3.43	70	Mar	2001
3.80	62	Mar	2001
3.93	98	Mar	2001
3.88	63	Mar	2001
3.40	44	Mar	2001
3.75	65	Mar	2001
4.10	65	Mar	2001
3.65	32	Mar	2001
3.73	35	Mar	2001
3.73	75	Mar	2001
3.90	62	Mar	2001
4.25	62	Mar	2001
3.38	53	Mar	2001
3.85	75	Mar	2001
4.03	64	Mar	2001
3.73	35	Mar	2001
3.68	59	Mar	2001
4.10	36	Mar	2001

Test Avg	AFQT %	Month	Year
3.93	53	Mar	2001
4.00	79	Mar	2001
3.70	34	Mar	2001
3.70	55	Mar	2001
4.23	90	Mar	2001
3.73	61	Mar	2001
4.10	99	Mar	2001
3.90	66	Mar	2001
3.43	43	Mar	2001
3.38	98	Mar	2001
4.08	43	Mar	2001
3.83	51	Mar	2001
4.23	58	Mar	2001
3.58	53	Mar	2001
3.75	68	Mar	2001
4.00	48	Mar	2001
4.33	99	Mar	2001
3.73	99	Mar	2001
3.33	43	Mar	2001
3.70	84	Mar	2001
4.08	77	Mar	2001
3.70	59	Mar	2001
4.23	53	Mar	2001
4.23	53	Mar	2001
3.40	56	Mar	2001
3.25	25	Mar	2001
3.85	33	Mar	2001
4.13	71	Mar	2001
4.35	93	Mar	2001
3.70	70	Mar	2001
3.83	59	Mar	2001
3.35	34	Mar	2001
4.38	57	Mar	2001
4.25	99	Mar	2001
3.48	36	Mar	2001
4.18	82	Apr	2001
4.38	62	Apr	2001
3.80	54	Apr	2001
3.98	46	Apr	2001
4.40	45	Apr	2001
3.65	65	Apr	2001
3.78	53	Apr	2001
4.35	70	Apr	2001
3.80	76	Apr	2001
3.53	64	Apr	2001
4.45	27	Apr	2001
3.98	59	Apr	2001
3.93	65	Apr	2001
4.20	57	Apr	2001

Test Avg	AFQT %	Month	Year
4.23	54	Apr	2001
3.78	43	Apr	2001
3.38	53	Apr	2001
4.38	85	Apr	2001
3.95	46	Apr	2001
4.15	34	Apr	2001
3.75	50	Apr	2001
3.83	75	Apr	2001
4.33	65	Apr	2001
4.43	90	Apr	2001
4.30	74	Apr	2001
4.03	51	Apr	2001
4.55	96	Apr	2001
3.45	59	Apr	2001
4.43	84	Apr	2001
3.88	75	Apr	2001
4.28	80	Apr	2001
3.70	99	Apr	2001
3.83	42	Apr	2001
4.30	75	Apr	2001
4.05	29	Apr	2001
4.28	88	Apr	2001
3.70	42	Apr	2001
3.55	19	Apr	2001
4.40	92	Apr	2001
3.98	71	Apr	2001
3.75	77	Apr	2001
3.45	55	Apr	2001
3.55	52	Apr	2001
3.03	56	Apr	2001
3.63	36	Apr	2001
3.73	96	Apr	2001
4.30	40	Apr	2001
4.10	29	Apr	2001
4.08	57	Apr	2001
4.30	21	Apr	2001
4.03	56	Apr	2001
4.50	84	Apr	2001
4.38	99	Apr	2001
3.23	62	Apr	2001
3.73	67	Apr	2001
3.78	46	Apr	2001
4.03	41	Apr	2001
3.63	85	Apr	2001
4.10	64	Apr	2001
4.00	65	Apr	2001
3.65	27	Apr	2001
3.60	42	Apr	2001
4.68	67	Apr	2001

Test Avg	AFQT %	Month	Year
4.15	90	Apr	2001
4.25	85	Apr	2001
4.33	57	Apr	2001
4.50	89	Apr	2001
4.20	99	May	2001
3.20	33	May	2001
4.20	80	May	2001
3.75	53	May	2001
3.78	71	May	2001
3.60	78	May	2001
4.00	59	May	2001
3.73	54	May	2001
3.33	64	May	2001
3.50	41	May	2001
3.38	26	May	2001
3.95	86	May	2001
2.75	22	May	2001
4.18	65	May	2001
4.03	61	May	2001
4.05	63	May	2001
3.80	85	May	2001
4.28	64	May	2001
3.40	46	May	2001
3.73	63	May	2001
4.13	59	May	2001
3.85	40	May	2001
3.73	77	May	2001
3.88	61	May	2001
3.83	45	May	2001
4.30	96	May	2001
3.75	52	May	2001
3.63	81	May	2001
3.40	65	May	2001
4.33	58	May	2001
4.13	61	May	2001
4.35	69	May	2001
3.70	75	May	2001
3.85	85	May	2001
3.73	48	May	2001
3.33	46	May	2001
4.45	51	May	2001
3.65	26	May	2001
3.95	76	May	2001
3.68	62	May	2001
3.28	42	May	2001
3.78	90	May	2001
3.60	40	May	2001
4.40	69	May	2001
4.25	89	May	2001

Test Avg	AFQT %	Month	Year
3.90	73	May	2001
3.90	53	May	2001
3.80	39	May	2001
3.48	47	May	2001
4.18	95	May	2001
4.45	92	May	2001
3.58	82	May	2001
4.00	74	May	2001
4.18	69	May	2001
3.78	54	May	2001
3.70	53	May	2001
4.13	66	May	2001
3.83	97	May	2001
4.35	99	May	2001
4.30	63	May	2001
3.43	84	May	2001
3.65	74	May	2001
3.20	38	May	2001
3.78	55	May	2001
3.28	53	May	2001
3.85	48	May	2001
4.23	99	May	2001
3.63	30	May	2001
3.73	69	May	2001
3.83	35	Jun	2001
4.40	84	Jun	2001
3.50	68	Jun	2001
3.95	75	Jun	2001
3.48	39	Jun	2001
3.40	45	Jun	2001
3.50	23	Jun	2001
3.00	56	Jun	2001
4.23	76	Jun	2001
3.60	32	Jun	2001
3.85	23	Jun	2001
3.43	50	Jun	2001
3.75	50	Jun	2001
3.93	78	Jun	2001
3.55	61	Jun	2001
3.55	63	Jun	2001
3.35	35	Jun	2001
3.78	39	Jun	2001
3.65	53	Jun	2001
3.53	38	Jun	2001
4.23	78	Jun	2001
3.85	74	Jun	2001
4.35	78	Jun	2001
3.48	48	Jun	2001
4.10	41	Jun	2001

Test Avg	AFQT %	Month	Year
3.45	33	Jun	2001
3.55	80	Jun	2001
3.20	26	Jun	2001
3.95	56	Jun	2001
3.28	32	Jun	2001
3.48	22	Jun	2001
3.50	52	Jun	2001
4.28	99	Jun	2001
4.45	50	Jun	2001
4.08	26	Jun	2001
4.35	55	Jun	2001
4.08	83	Jun	2001
3.93	37	Jun	2001
3.48	48	Jun	2001
3.75	68	Jun	2001
3.80	86	Jun	2001
3.78	52	Jun	2001
4.05	33	Jun	2001
3.70	50	Jun	2001
3.95	77	Jun	2001
3.28	16	Jun	2001
3.85	43	Jun	2001
3.73	63	Jun	2001
3.48	42	Jun	2001
4.28	90	Jun	2001
3.33	54	Jun	2001
4.00	26	Jun	2001
3.68	85	Jun	2001
3.70	52	Jun	2001
3.90	61	Jun	2001
4.13	80	Jun	2001
3.48	42	Jun	2001
4.18	68	Jun	2001
4.35	73	Jun	2001
3.70	19	Jun	2001
3.93	67	Jun	2001
3.63	36	Jun	2001
4.15	73	Jun	2001
3.58	27	Jun	2001
4.38	50	Jun	2001
3.83	65	Jun	2001
3.98	35	Jun	2001
3.48	35	Jun	2001
3.63	33	Jun	2001
3.75	63	Jun	2001
3.58	99	Jun	2001
4.40	71	Jun	2001
3.38	40	Jun	2001
3.88	50	Jun	2001

Test Avg	AFQT %	Month	Year
3.65	46	Jun	2001
3.43	57	Jun	2001
3.55	55	Jun	2001
4.10	56	Jun	2001
3.73	84	Jun	2001
3.20	39	Jun	2001
4.23	98	Jun	2001
3.70	53	Jun	2001
3.98	99	Jun	2001
3.93	73	Jun	2001
3.50	40	Jun	2001
4.25	81	Jun	2001
3.95	51	Jul	2001
3.40	31	Jul	2001
3.95	57	Jul	2001
3.88	81	Jul	2001
4.38	76	Jul	2001
3.70	27	Jul	2001
4.13	46	Jul	2001
4.60	82	Jul	2001
4.28	84	Jul	2001
4.08	65	Jul	2001
4.03	53	Jul	2001
3.80	33	Jul	2001
3.48	41	Jul	2001
4.48	42	Jul	2001
4.35	86	Jul	2001
4.20	64	Jul	2001
3.85	26	Jul	2001
4.33	76	Jul	2001
4.08	52	Jul	2001
4.23	35	Jul	2001
4.08	29	Jul	2001
3.68	47	Jul	2001
3.70	71	Jul	2001
4.10	42	Jul	2001
4.08	70	Jul	2001
3.53	35	Jul	2001
4.33	35	Jul	2001
4.20	81	Jul	2001
4.05	52	Jul	2001
4.50	61	Jul	2001
3.63	53	Jul	2001
4.08	52	Jul	2001
3.93	49	Jul	2001
3.73	58	Jul	2001
3.90	27	Jul	2001
3.50	35	Jul	2001
3.90	46	Jul	2001

Test Avg	AFQT %	Month	Year
4.35	53	Jul	2001
4.53	62	Jul	2001
4.38	76	Jul	2001
4.50	80	Jul	2001
3.75	43	Jul	2001
3.58	56	Jul	2001
3.88	43	Jul	2001
4.60	83	Jul	2001
3.40	36	Jul	2001
4.28	81	Jul	2001
3.45	23	Jul	2001
4.23	85	Jul	2001
4.65	97	Jul	2001
4.45	69	Jul	2001
4.08	16	Jul	2001
4.28	80	Jul	2001
3.70	24	Jul	2001
3.78	52	Jul	2001
4.63	37	Jul	2001
3.58	61	Jul	2001
4.05	37	Jul	2001
4.35	84	Jul	2001
4.73	99	Jul	2001
3.90	74	Jul	2001
4.33	55	Jul	2001
4.43	35	Jul	2001
3.70	61	Jul	2001
3.43	17	Jul	2001
3.15	29	Jul	2001
4.13	48	Jul	2001
3.68	50	Jul	2001
4.33	53	Jul	2001
4.05	61	Jul	2001
3.90	51	Jul	2001
3.73	62	Jul	2001
4.10	62	Jul	2001
3.50	42	Jul	2001
4.50	81	Jul	2001
3.88	48	Jul	2001
3.60	34	Jul	2001
4.60	63	Jul	2001
3.70	22	Jul	2001
3.85	22	Jul	2001
3.85	55	Jul	2001
4.30	52	Jul	2001
3.80	66	Jul	2001
4.13	53	Jul	2001
4.10	34	Aug	2001
4.00	64	Aug	2001

Test Avg	AFQT %	Month	Year
3.65	35	Aug	2001
3.70	42	Aug	2001
3.23	40	Aug	2001
3.80	29	Aug	2001
4.00	53	Aug	2001
3.40	57	Aug	2001
4.00	49	Aug	2001
4.30	48	Aug	2001
4.73	92	Aug	2001
3.78	35	Aug	2001
3.90	53	Aug	2001
3.80	58	Aug	2001
4.48	84	Aug	2001
4.38	57	Aug	2001
3.85	74	Aug	2001
3.78	55	Aug	2001
3.85	54	Aug	2001
4.45	64	Aug	2001
3.80	73	Aug	2001
3.73	31	Aug	2001
4.25	72	Aug	2001
4.20	76	Aug	2001
4.20	50	Aug	2001
4.20	19	Aug	2001
4.53	89	Aug	2001
4.38	41	Aug	2001
4.33	98	Aug	2001
4.30	99	Aug	2001
4.13	67	Aug	2001
4.23	39	Aug	2001
3.68	53	Aug	2001
4.10	49	Aug	2001
3.93	38	Aug	2001
4.10	47	Aug	2001
3.75	57	Aug	2001
4.05	38	Aug	2001
4.05	62	Aug	2001
4.43	88	Aug	2001
4.25	50	Aug	2001
4.18	72	Aug	2001
3.60	74	Aug	2001
3.75	56	Aug	2001
4.50	56	Aug	2001
4.20	34	Aug	2001
4.50	84	Aug	2001
4.00	40	Aug	2001
4.15	74	Aug	2001
4.05	69	Aug	2001
4.03	50	Aug	2001

Test Avg	AFQT %	Month	Year
4.28	78	Aug	2001
4.43	85	Aug	2001
4.10	55	Aug	2001
4.75	68	Aug	2001
4.03	77	Aug	2001
4.05	57	Aug	2001
3.58	42	Aug	2001
3.88	62	Aug	2001
4.38	47	Aug	2001
4.48	47	Aug	2001
3.98	49	Aug	2001
3.48	32	Aug	2001
3.68	65	Aug	2001
3.65	36	Aug	2001
4.18	70	Aug	2001
3.25	44	Aug	2001
4.38	69	Aug	2001
4.13	83	Aug	2001
4.35	63	Aug	2001
3.80	58	Aug	2001
4.08	86	Aug	2001
4.05	32	Aug	2001
4.00	46	Aug	2001
3.53	35	Aug	2001
3.80	72	Aug	2001
3.88	55	Aug	2001
3.20	40	Sep	2001
4.23	80	Sep	2001
3.88	58	Sep	2001
4.15	38	Sep	2001
3.95	66	Sep	2001
3.53	65	Sep	2001
3.10	32	Sep	2001
3.93	79	Sep	2001
2.88	42	Sep	2001
3.48	35	Sep	2001
4.45	54	Sep	2001
4.38	84	Sep	2001
4.53	89	Sep	2001
3.88	68	Sep	2001
3.78	73	Sep	2001
3.80	34	Sep	2001
3.60	35	Sep	2001
2.98	39	Sep	2001
3.93	61	Sep	2001
4.00	50	Sep	2001
4.53	76	Sep	2001
3.33	33	Sep	2001
3.60	48	Sep	2001

Test Avg	AFQT %	Month	Year
3.03	74	Sep	2001
4.10	65	Sep	2001
3.43	34	Sep	2001
3.88	53	Sep	2001
3.78	59	Sep	2001
4.00	79	Sep	2001
3.83	80	Sep	2001
4.10	70	Sep	2001
4.18	61	Sep	2001
3.33	54	Sep	2001
3.40	35	Sep	2001
3.80	66	Sep	2001
4.63	99	Sep	2001
4.10	71	Sep	2001
4.23	56	Sep	2001
4.25	49	Sep	2001
3.50	53	Sep	2001
3.90	70	Sep	2001
2.98	38	Sep	2001
3.23	79	Sep	2001
3.03	51	Sep	2001
3.55	38	Sep	2001
4.05	61	Sep	2001
3.10	41	Sep	2001
3.73	67	Sep	2001
3.65	42	Sep	2001
4.13	43	Sep	2001
3.63	56	Sep	2001
4.45	91	Sep	2001
3.73	52	Sep	2001
4.15	45	Sep	2001
3.80	80	Sep	2001
3.78	84	Sep	2001
3.40	35	Sep	2001
4.00	55	Sep	2001
3.48	52	Sep	2001
3.80	67	Sep	2001
4.08	67	Sep	2001
4.05	74	Sep	2001
3.08	33	Sep	2001
3.70	35	Sep	2001
3.73	45	Sep	2001
3.75	54	Sep	2001
4.10	54	Sep	2001
3.85	54	Sep	2001
3.83	53	Sep	2001
3.75	67	Sep	2001
3.58	42	Sep	2001
4.10	47	Sep	2001

Test Avg	AFQT %	Month	Year
3.90	66	Sep	2001
3.93	46	Sep	2001
3.63	58	Sep	2001
3.63	33	Sep	2001
3.73	76	Sep	2001
4.28	84	Sep	2001
4.10	86	Sep	2001
4.50	69	Sep	2001
3.65	62	Sep	2001
4.03	67	Sep	2001
4.08	46	Sep	2001
3.35	65	Sep	2001
2.80	33	Sep	2001
3.65	59	Sep	2001
4.08	41	Sep	2001
3.38	39	Oct	2001
3.35	41	Oct	2001
3.23	43	Oct	2001
3.78	63	Oct	2001
3.50	42	Oct	2001
3.98	48	Oct	2001
3.70	45	Oct	2001
4.53	48	Oct	2001
3.38	36	Oct	2001
3.88	59	Oct	2001
3.60	48	Oct	2001
3.28	31	Oct	2001
4.18	73	Oct	2001
3.73	35	Oct	2001
3.43	32	Oct	2001
4.23	61	Oct	2001
3.35	41	Oct	2001
3.90	43	Oct	2001
3.50	36	Oct	2001
4.18	62	Oct	2001
3.68	68	Oct	2001
2.45	31	Oct	2001
4.25	95	Oct	2001
3.80	52	Oct	2001
4.50	87	Oct	2001
4.08	57	Oct	2001
3.68	45	Oct	2001
4.13	68	Oct	2001
4.13	80	Oct	2001
3.60	34	Oct	2001
3.95	67	Oct	2001
3.78	65	Oct	2001
3.70	37	Oct	2001
4.03	63	Oct	2001

Test Avg	AFQT %	Month	Year
3.23	33	Oct	2001
4.15	67	Oct	2001
3.80	57	Oct	2001
4.05	62	Oct	2001
3.50	42	Oct	2001
3.90	34	Oct	2001
4.10	57	Oct	2001
3.23	57	Oct	2001
3.30	32	Oct	2001
3.75	49	Oct	2001
3.43	33	Oct	2001
3.38	38	Oct	2001
3.03	39	Oct	2001
2.93	32	Oct	2001
3.80	58	Oct	2001
4.03	37	Oct	2001
4.08	78	Oct	2001
3.30	42	Oct	2001
4.28	55	Oct	2001
4.43	74	Oct	2001
3.83	49	Oct	2001
4.43	89	Oct	2001
4.28	71	Oct	2001
3.80	32	Oct	2001
3.25	53	Oct	2001
4.28	53	Oct	2001
3.95	73	Oct	2001
4.28	77	Oct	2001
3.33	42	Oct	2001
3.98	96	Oct	2001
4.10	48	Oct	2001
3.98	69	Oct	2001
3.25	24	Oct	2001
4.35	75	Oct	2001
3.93	36	Oct	2001
3.45	47	Oct	2001
4.70	80	Oct	2001
3.60	47	Oct	2001
4.08	70	Oct	2001
4.30	91	Oct	2001
3.45	40	Oct	2001
4.38	98	Oct	2001
4.35	93	Oct	2001
4.15	85	Oct	2001
4.50	63	Oct	2001
3.63	49	Oct	2001
3.70	34	Oct	2001
4.33	68	Oct	2001
3.63	48	Oct	2001

Test Avg	AFQT %	Month	Year
3.60	82	Oct	2001
3.58	37	Oct	2001
4.10	56	Oct	2001
3.85	53	Nov	2001
3.33	41	Nov	2001
3.73	53	Nov	2001
3.18	51	Nov	2001
2.90	40	Nov	2001
3.78	35	Nov	2001
3.60	70	Nov	2001
3.45	66	Nov	2001
4.03	61	Nov	2001
3.58	69	Nov	2001
4.55	82	Nov	2001
3.40	53	Nov	2001
3.18	40	Nov	2001
3.35	36	Nov	2001
3.58	50	Nov	2001
3.63	37	Nov	2001
3.40	69	Nov	2001
3.68	53	Nov	2001
3.20	53	Nov	2001
4.00	54	Nov	2001
2.85	31	Nov	2001
3.68	40	Nov	2001
3.25	50	Nov	2001
3.88	50	Nov	2001
3.50	41	Nov	2001
3.25	72	Nov	2001
3.45	47	Nov	2001
4.58	84	Nov	2001
3.00	34	Nov	2001
3.40	59	Nov	2001
3.58	80	Nov	2001
3.38	32	Nov	2001
3.70	58	Nov	2001
3.18	46	Nov	2001
3.80	43	Nov	2001
3.55	35	Nov	2001
4.28	57	Nov	2001
3.45	72	Nov	2001
3.93	32	Nov	2001
2.90	39	Nov	2001
3.60	52	Nov	2001
3.53	62	Nov	2001
3.85	48	Nov	2001
3.95	61	Nov	2001
3.80	45	Nov	2001
4.25	61	Nov	2001

Test Avg	AFQT %	Month	Year
3.83	85	Nov	2001
4.23	51	Nov	2001
3.45	45	Nov	2001
3.85	47	Nov	2001
4.18	96	Nov	2001
4.58	90	Nov	2001
4.23	52	Nov	2001
3.95	51	Nov	2001
3.68	32	Nov	2001
3.98	32	Nov	2001
4.05	59	Nov	2001
3.33	64	Nov	2001
2.80	49	Nov	2001
3.88	87	Nov	2001
3.88	50	Nov	2001
3.38	51	Nov	2001
3.85	47	Nov	2001
3.95	59	Nov	2001
4.13	47	Nov	2001
3.53	54	Nov	2001
3.50	53	Nov	2001
3.98	86	Nov	2001
3.48	71	Nov	2001
4.25	64	Nov	2001
2.63	40	Nov	2001
3.68	41	Nov	2001
3.20	32	Nov	2001
2.90	32	Nov	2001
4.05	80	Nov	2001
3.30	42	Nov	2001
3.18	42	Nov	2001
3.90	70	Nov	2001
3.10	37	Nov	2001
3.80	50	Nov	2001
3.58	42	Dec	2001
3.68	33	Dec	2001
4.03	69	Dec	2001
4.28	62	Dec	2001
4.00	90	Dec	2001
3.75	64	Dec	2001
3.65	33	Dec	2001
3.70	53	Dec	2001
4.13	53	Dec	2001
3.85	78	Dec	2001
4.23	66	Dec	2001
3.33	38	Dec	2001
4.68	61	Dec	2001
4.38	48	Dec	2001
4.13	74	Dec	2001

Test Avg	AFQT %	Month	Year
4.20	75	Dec	2001
4.45	83	Dec	2001
2.95	42	Dec	2001
4.63	99	Dec	2001
3.40	80	Dec	2001
4.23	97	Dec	2001
3.68	37	Dec	2001
3.65	73	Dec	2001
4.13	77	Dec	2001
3.53	47	Dec	2001
3.60	47	Dec	2001
3.63	62	Dec	2001
4.20	68	Dec	2001
4.50	80	Dec	2001
4.10	86	Dec	2001
3.88	86	Dec	2001
4.53	99	Dec	2001
4.23	78	Dec	2001
4.30	64	Dec	2001
3.60	41	Dec	2001
3.48	53	Dec	2001
4.48	68	Dec	2001
3.98	72	Dec	2001
3.75	62	Dec	2001
3.35	49	Dec	2001
4.48	96	Dec	2001
3.85	56	Dec	2001
3.50	42	Dec	2001
4.20	95	Dec	2001
3.65	42	Dec	2001
3.98	58	Dec	2001
4.13	54	Dec	2001
4.38	67	Dec	2001
4.03	36	Dec	2001
4.00	81	Dec	2001
3.40	31	Dec	2001
3.88	59	Dec	2001
3.93	86	Dec	2001
4.15	96	Dec	2001
3.98	47	Dec	2001
4.33	70	Dec	2001
3.25	41	Dec	2001
3.60	38	Dec	2001
3.90	63	Dec	2001
4.00	55	Dec	2001
4.18	86	Dec	2001
4.30	94	Dec	2001
4.05	53	Dec	2001
3.73	61	Dec	2001

Test Avg	AFQT %	Month	Year
4.25	75	Dec	2001
3.55	58	Dec	2001
3.45	45	Dec	2001
3.85	50	Dec	2001
3.65	84	Dec	2001
4.08	84	Dec	2001
4.50	77	Dec	2001
3.83	73	Dec	2001
3.08	49	Dec	2001
4.33	96	Dec	2001
4.03	59	Jan	2003
3.93	52	Jan	2003
3.77	37	Jan	2003
4.20	51	Jan	2003
4.20	86	Jan	2003
4.03	64	Jan	2003
3.47	45	Jan	2003
4.43	67	Jan	2003
4.40	77	Jan	2003
4.33	40	Jan	2003
4.30	86	Jan	2003
3.80	32	Jan	2003
4.63	79	Jan	2003
3.83	58	Jan	2003
3.40	53	Jan	2003
4.10	35	Jan	2003
4.03	63	Jan	2003
4.00	82	Jan	2003
3.43	79	Jan	2003
4.63	77	Jan	2003
3.87	37	Jan	2003
4.10	77	Jan	2003
3.73	36	Jan	2003
4.20	50	Jan	2003
3.73	36	Jan	2003
4.00	68	Jan	2003
3.97	53	Jan	2003
4.40	79	Jan	2003
3.73	35	Jan	2003
3.73	33	Jan	2003
3.87	51	Jan	2003
4.33	42	Jan	2003
4.43	61	Jan	2003
4.30	67	Jan	2003
4.37	83	Jan	2003
4.00	77	Jan	2003
4.43	70	Jan	2003
4.40	64	Jan	2003
4.17	32	Jan	2003

Test Avg	AFQT %	Month	Year
4.37	66	Jan	2003
4.47	87	Jan	2003
4.00	42	Jan	2003
4.53	82	Jan	2003
4.50	42	Jan	2003
4.70	88	Jan	2003
4.07	56	Jan	2003
3.80	43	Jan	2003
4.43	93	Jan	2003
4.53	99	Jan	2003
4.43	79	Jan	2003
3.17	35	Jan	2003
3.60	48	Jan	2003
4.13	80	Jan	2003
4.53	79	Jan	2003
4.27	71	Jan	2003
4.10	49	Jan	2003
3.53	42	Jan	2003
3.30	42	Jan	2003
3.73	47	Jan	2003
3.50	41	Jan	2003
4.53	91	Jan	2003
3.83	36	Jan	2003
4.43	97	Jan	2003
3.23	33	Jan	2003
3.83	69	Jan	2003
3.70	56	Jan	2003
3.97	32	Jan	2003
3.90	69	Jan	2003
4.33	65	Feb	2003
4.07	43	Feb	2003
4.00	40	Feb	2003
4.23	68	Feb	2003
4.50	87	Feb	2003
3.77	33	Feb	2003
3.83	59	Feb	2003
4.33	78	Feb	2003
3.60	46	Feb	2003
3.90	35	Feb	2003
3.53	44	Feb	2003
4.03	74	Feb	2003
4.17	86	Feb	2003
3.93	56	Feb	2003
3.83	43	Feb	2003
3.70	54	Feb	2003
4.10	47	Feb	2003
3.90	46	Feb	2003
4.23	80	Feb	2003
4.07	41	Feb	2003

Test Avg	AFQT %	Month	Year
4.10	63	Feb	2003
4.43	73	Feb	2003
3.77	35	Feb	2003
4.27	75	Feb	2003
4.03	76	Feb	2003
3.33	44	Feb	2003
4.30	37	Feb	2003
4.23	57	Feb	2003
3.77	35	Feb	2003
4.27	68	Feb	2003
4.47	72	Feb	2003
3.87	37	Feb	2003
4.60	92	Feb	2003
3.83	43	Feb	2003
4.43	86	Feb	2003
3.70	33	Feb	2003
3.83	48	Feb	2003
3.50	35	Feb	2003
4.33	75	Feb	2003
3.57	64	Feb	2003
3.43	36	Feb	2003
4.53	93	Feb	2003
4.13	49	Feb	2003
3.07	34	Feb	2003
4.57	99	Feb	2003
3.87	41	Feb	2003
3.97	49	Feb	2003
3.57	36	Feb	2003
3.97	37	Feb	2003
4.10	33	Feb	2003
3.63	39	Feb	2003
4.33	65	Feb	2003
4.23	59	Feb	2003
4.10	43	Feb	2003
4.13	65	Feb	2003
4.20	55	Feb	2003
3.40	40	Feb	2003
4.20	82	Feb	2003
4.47	79	Feb	2003
3.90	39	Feb	2003
4.50	75	Mar	2003
3.57	35	Mar	2003
4.47	45	Mar	2003
3.87	40	Mar	2003
3.87	48	Mar	2003
3.87	45	Mar	2003
4.63	87	Mar	2003
3.90	33	Mar	2003
4.03	66	Mar	2003

Test Avg	AFQT %	Month	Year
4.07	56	Mar	2003
3.60	61	Mar	2003
4.43	76	Mar	2003
3.67	42	Mar	2003
4.17	72	Mar	2003
4.23	51	Mar	2003
4.13	84	Mar	2003
3.63	59	Mar	2003
4.17	58	Mar	2003
4.27	53	Mar	2003
3.77	51	Mar	2003
4.17	39	Mar	2003
3.13	34	Mar	2003
3.73	50	Mar	2003
4.50	81	Mar	2003
3.60	69	Mar	2003
4.43	71	Mar	2003
4.27	80	Mar	2003
4.03	43	Mar	2003
3.63	34	Mar	2003
4.20	56	Mar	2003
4.03	53	Mar	2003
4.23	84	Mar	2003
4.63	86	Mar	2003
3.93	35	Mar	2003
4.13	49	Mar	2003
4.33	99	Mar	2003
4.23	58	Mar	2003
4.37	54	Mar	2003
4.33	88	Mar	2003
4.03	58	Mar	2003
3.93	72	Mar	2003
3.60	40	Mar	2003
3.67	61	Mar	2003
4.50	67	Mar	2003
3.40	36	Mar	2003
4.60	91	Mar	2003
4.27	56	Mar	2003
4.37	89	Mar	2003
3.60	52	Mar	2003
3.47	40	Mar	2003
4.13	68	Mar	2003
4.27	81	Mar	2003
4.47	68	Mar	2003
3.90	36	Mar	2003
4.70	97	Apr	2003
3.93	36	Apr	2003
4.67	89	Apr	2003
4.17	44	Apr	2003

Test Avg	AFQT %	Month	Year
4.57	57	Apr	2003
4.23	67	Apr	2003
4.43	43	Apr	2003
4.57	80	Apr	2003
4.30	67	Apr	2003
4.07	84	Apr	2003
4.67	89	Apr	2003
4.17	41	Apr	2003
3.80	41	Apr	2003
4.47	87	Apr	2003
3.90	38	Apr	2003
3.70	36	Apr	2003
4.43	48	Apr	2003
4.67	73	Apr	2003
3.80	32	Apr	2003
4.27	61	Apr	2003
4.50	40	Apr	2003
4.43	69	Apr	2003
4.00	35	Apr	2003
4.43	34	Apr	2003
4.77	93	Apr	2003
4.30	51	Apr	2003
4.63	74	Apr	2003
4.93	97	Apr	2003
4.80	54	Apr	2003
4.50	61	Apr	2003
3.53	32	Apr	2003
4.57	85	Apr	2003
4.47	61	Apr	2003
4.10	54	Apr	2003
4.47	59	Apr	2003
4.67	73	Apr	2003
3.90	33	Apr	2003
4.73	74	Apr	2003
4.57	50	Apr	2003
4.27	51	Apr	2003
4.47	35	Apr	2003
4.57	48	Apr	2003
4.40	32	Apr	2003
4.13	42	Apr	2003
4.33	43	Apr	2003
4.23	54	Apr	2003
4.27	35	Apr	2003
4.10	52	Apr	2003
3.77	50	Apr	2003
4.47	41	Apr	2003
4.63	74	Apr	2003
4.63	49	Apr	2003
4.07	51	Apr	2003

Test Avg	AFQT %	Month	Year
4.77	62	Apr	2003
4.63	66	Apr	2003
4.83	99	Apr	2003
4.10	51	Apr	2003
4.30	42	Apr	2003
4.70	77	Apr	2003
4.03	51	Apr	2003
4.43	61	Apr	2003
4.83	99	Apr	2003
4.37	33	Apr	2003
4.10	47	Apr	2003
4.17	41	Apr	2003
4.93	93	Apr	2003
4.37	48	May	2003
4.20	50	May	2003
4.30	97	May	2003
4.17	52	May	2003
4.33	42	May	2003
4.53	77	May	2003
4.87	91	May	2003
4.57	61	May	2003
4.67	55	May	2003
4.07	54	May	2003
3.80	46	May	2003
4.47	92	May	2003
4.43	88	May	2003
4.07	34	May	2003
4.80	79	May	2003
4.50	50	May	2003
4.73	74	May	2003
3.73	43	May	2003
4.30	68	May	2003
4.57	71	May	2003
3.67	36	May	2003
4.67	69	May	2003
4.63	99	May	2003
4.43	95	May	2003
4.77	63	May	2003
4.13	65	May	2003
4.67	82	May	2003
4.63	85	May	2003
4.10	37	May	2003
3.90	31	May	2003
4.40	40	May	2003
4.77	81	May	2003
4.33	38	May	2003
4.33	63	May	2003
4.93	99	May	2003
4.03	62	May	2003

Test Avg	AFQT %	Month	Year
4.13	75	May	2003
4.57	94	May	2003
4.87	93	May	2003
4.13	32	May	2003
4.50	91	May	2003
4.67	71	May	2003
4.77	84	May	2003
4.67	58	May	2003
4.43	49	May	2003
4.50	61	May	2003
4.00	73	May	2003
4.73	95	May	2003
4.70	83	May	2003
4.43	61	May	2003
4.47	33	May	2003
4.37	50	May	2003
4.73	83	May	2003
4.50	65	May	2003
3.93	77	May	2003
4.73	95	May	2003
4.57	90	May	2003
4.50	76	May	2003
4.57	94	May	2003
4.63	83	May	2003
4.63	48	May	2003
4.83	90	Jun	2003
4.80	49	Jun	2003
4.67	70	Jun	2003
4.80	51	Jun	2003
4.80	62	Jun	2003
4.80	49	Jun	2003
4.83	63	Jun	2003
4.70	36	Jun	2003
4.83	42	Jun	2003
4.83	77	Jun	2003
4.83	98	Jun	2003
4.67	42	Jun	2003
4.53	56	Jun	2003
4.57	43	Jun	2003
4.47	41	Jun	2003
4.67	40	Jun	2003
4.53	47	Jun	2003
4.63	36	Jun	2003
4.40	35	Jun	2003
4.57	33	Jun	2003
4.73	46	Jun	2003
4.47	31	Jun	2003
4.83	71	Jun	2003
4.50	68	Jun	2003

Test Avg	AFQT %	Month	Year
4.27	85	Jun	2003
4.73	51	Jun	2003
4.67	46	Jun	2003
4.50	35	Jun	2003
4.70	58	Jun	2003
4.83	51	Jun	2003
4.67	35	Jun	2003
4.63	37	Jun	2003
4.87	90	Jun	2003
4.77	63	Jun	2003
4.50	48	Jun	2003
4.63	93	Jun	2003
4.73	58	Jun	2003
4.40	38	Jun	2003
4.87	56	Jun	2003
4.73	53	Jun	2003
4.67	38	Jun	2003
4.63	66	Jun	2003
4.70	82	Jun	2003
4.67	54	Jun	2003
4.60	63	Jun	2003
4.43	47	Jun	2003
4.77	42	Jun	2003
4.87	84	Jun	2003
4.53	43	Jun	2003
4.70	83	Jun	2003
4.73	45	Jun	2003
4.10	48	Jun	2003
4.67	82	Jun	2003
4.33	54	Jun	2003
4.70	41	Jun	2003
4.83	67	Jun	2003
4.77	54	Jun	2003
4.73	46	Jun	2003
4.60	66	Jun	2003
4.67	89	Jun	2003
4.37	64	Jun	2003
4.87	50	Jun	2003
4.83	67	Jun	2003
4.57	43	Jul	2003
4.43	51	Jul	2003
4.73	78	Jul	2003
4.83	93	Jul	2003
4.17	33	Jul	2003
4.67	80	Jul	2003
4.77	50	Jul	2003
4.50	59	Jul	2003
4.37	70	Jul	2003
4.27	85	Jul	2003

Test Avg	AFQT %	Month	Year
3.97	61	Jul	2003
4.37	43	Jul	2003
3.73	36	Jul	2003
3.80	51	Jul	2003
3.93	36	Jul	2003
4.57	53	Jul	2003
4.87	54	Jul	2003
4.40	59	Jul	2003
4.47	48	Jul	2003
4.37	61	Jul	2003
4.47	70	Jul	2003
4.77	61	Jul	2003
4.67	47	Jul	2003
4.37	71	Jul	2003
4.47	84	Jul	2003
4.63	66	Jul	2003
4.27	71	Jul	2003
4.30	53	Jul	2003
4.33	50	Jul	2003
3.97	58	Jul	2003
3.53	37	Jul	2003
4.63	47	Jul	2003
4.47	45	Jul	2003
4.57	62	Jul	2003
3.73	45	Jul	2003
4.40	45	Jul	2003
4.40	46	Jul	2003
4.23	38	Jul	2003
3.77	48	Jul	2003
4.67	66	Jul	2003
4.60	67	Jul	2003
4.67	70	Jul	2003
4.60	99	Jul	2003
3.93	35	Jul	2003
4.47	35	Jul	2003
4.40	37	Jul	2003
4.20	57	Jul	2003
4.40	67	Jul	2003
4.67	79	Jul	2003
4.77	72	Jul	2003
4.30	39	Jul	2003
4.13	70	Jul	2003
4.47	89	Jul	2003
4.17	46	Jul	2003
4.80	90	Jul	2003
4.13	33	Jul	2003
4.10	65	Jul	2003
4.77	63	Jul	2003
4.77	78	Jul	2003

Test Avg	AFQT %	Month	Year
4.27	40	Jul	2003
4.70	58	Jul	2003
4.23	35	Jul	2003
4.70	68	Jul	2003
4.10	55	Jul	2003
4.33	73	Aug	2003
4.17	47	Aug	2003
4.20	38	Aug	2003
3.90	46	Aug	2003
4.50	31	Aug	2003
4.53	53	Aug	2003
4.63	52	Aug	2003
4.13	40	Aug	2003
3.47	35	Aug	2003
3.67	33	Aug	2003
4.63	51	Aug	2003
4.47	87	Aug	2003
4.40	58	Aug	2003
4.10	94	Aug	2003
4.57	31	Aug	2003
4.13	33	Aug	2003
4.20	84	Aug	2003
4.43	54	Aug	2003
4.43	47	Aug	2003
4.10	36	Aug	2003
4.00	38	Aug	2003
4.57	92	Aug	2003
4.13	32	Aug	2003
4.10	84	Aug	2003
3.70	48	Aug	2003
4.47	42	Aug	2003
4.73	49	Aug	2003
4.33	35	Aug	2003
4.60	99	Aug	2003
4.43	55	Aug	2003
3.80	59	Aug	2003
4.37	80	Aug	2003
4.33	32	Aug	2003
4.23	37	Aug	2003
4.50	74	Aug	2003
4.30	98	Aug	2003
4.30	37	Aug	2003
4.40	94	Aug	2003
3.93	37	Aug	2003
3.87	46	Aug	2003
3.90	74	Aug	2003
4.37	35	Aug	2003
3.93	32	Aug	2003
4.07	85	Aug	2003

Test Avg	AFQT %	Month	Year
4.10	48	Aug	2003
3.87	58	Aug	2003
4.43	78	Aug	2003
4.37	79	Aug	2003
4.33	44	Aug	2003
4.53	44	Aug	2003
4.57	96	Aug	2003
4.47	32	Aug	2003
4.13	40	Aug	2003
4.43	58	Aug	2003
4.63	33	Aug	2003
4.57	37	Aug	2003
4.23	46	Aug	2003
4.43	88	Aug	2003
3.87	58	Aug	2003
3.90	79	Aug	2003
4.07	65	Aug	2003
4.17	48	Aug	2003
3.87	40	Aug	2003
3.80	49	Aug	2003
4.23	75	Aug	2003
4.50	47	Aug	2003
4.33	77	Aug	2003
3.73	41	Aug	2003
4.50	64	Aug	2003
4.00	56	Aug	2003
4.37	53	Aug	2003
4.27	83	Aug	2003
4.23	69	Aug	2003
4.03	37	Aug	2003
4.57	62	Aug	2003
3.60	85	Aug	2003
4.53	78	Aug	2003
4.53	77	Aug	2003
4.30	66	Aug	2003
4.20	52	Aug	2003
4.57	56	Aug	2003
4.47	74	Sep	2003
4.53	82	Sep	2003
4.37	89	Sep	2003
4.47	33	Sep	2003
4.37	53	Sep	2003
4.43	40	Sep	2003
4.00	53	Sep	2003
4.80	96	Sep	2003
4.23	52	Sep	2003
4.60	73	Sep	2003
4.73	40	Sep	2003
4.63	61	Sep	2003

Test Avg	AFQT %	Month	Year
4.73	76	Sep	2003
4.63	62	Sep	2003
4.67	80	Sep	2003
4.43	67	Sep	2003
4.00	53	Sep	2003
4.43	59	Sep	2003
4.33	70	Sep	2003
4.27	51	Sep	2003
4.70	97	Sep	2003
3.93	36	Sep	2003
4.27	76	Sep	2003
4.03	51	Sep	2003
4.37	61	Sep	2003
4.37	41	Sep	2003
4.30	68	Sep	2003
4.47	63	Sep	2003
3.97	80	Sep	2003
4.27	61	Sep	2003
4.40	95	Sep	2003
4.50	64	Sep	2003
4.60	59	Sep	2003
4.03	51	Sep	2003
4.50	51	Sep	2003
4.77	71	Sep	2003
4.73	77	Sep	2003
4.43	70	Sep	2003
4.43	40	Sep	2003
4.63	80	Sep	2003
4.67	62	Sep	2003
3.57	37	Sep	2003
3.80	47	Sep	2003
4.00	43	Sep	2003
4.33	41	Sep	2003
4.73	89	Sep	2003
4.30	66	Sep	2003
4.73	97	Sep	2003
4.33	53	Sep	2003
3.93	51	Sep	2003
4.60	65	Sep	2003
4.67	85	Sep	2003
3.73	45	Sep	2003
4.50	75	Sep	2003
4.27	47	Sep	2003
4.37	89	Sep	2003
4.73	66	Sep	2003
4.03	52	Sep	2003
4.77	70	Sep	2003
4.07	52	Sep	2003
4.10	48	Sep	2003

Test Avg	AFQT %	Month	Year
3.77	53	Sep	2003
4.30	87	Sep	2003
3.77	32	Sep	2003
4.33	53	Sep	2003
4.20	42	Sep	2003
4.70	77	Sep	2003
4.43	56	Sep	2003
4.60	80	Sep	2003
3.83	38	Sep	2003
4.53	78	Sep	2003
4.47	35	Oct	2003
4.60	40	Oct	2003
3.63	32	Oct	2003
4.37	35	Oct	2003
4.60	37	Oct	2003
4.77	82	Oct	2003
4.80	64	Oct	2003
4.30	54	Oct	2003
4.73	97	Oct	2003
4.30	46	Oct	2003
4.60	51	Oct	2003
4.37	41	Oct	2003
4.43	53	Oct	2003
4.67	68	Oct	2003
4.53	61	Oct	2003
4.50	75	Oct	2003
4.73	70	Oct	2003
4.30	45	Oct	2003
4.63	42	Oct	2003
4.53	90	Oct	2003
4.60	72	Oct	2003
4.30	51	Oct	2003
4.80	64	Oct	2003
4.83	54	Oct	2003
4.80	96	Oct	2003
4.90	82	Oct	2003
4.70	70	Oct	2003
4.67	61	Oct	2003
4.90	93	Oct	2003
4.30	35	Oct	2003
4.67	64	Oct	2003
4.67	47	Oct	2003
4.70	53	Oct	2003
4.50	50	Oct	2003
4.53	61	Oct	2003
4.67	41	Oct	2003
4.17	32	Oct	2003
3.97	45	Oct	2003
4.97	74	Oct	2003

Test Avg	AFQT %	Month	Year
4.80	58	Oct	2003
4.70	47	Oct	2003
4.67	82	Oct	2003
4.63	70	Oct	2003
4.23	50	Oct	2003
4.77	58	Oct	2003
4.33	31	Oct	2003
4.43	35	Oct	2003
4.30	46	Oct	2003
4.60	86	Oct	2003
4.40	38	Oct	2003
4.77	57	Oct	2003
4.70	54	Oct	2003
4.67	73	Oct	2003
4.40	47	Oct	2003
4.90	75	Oct	2003
4.47	42	Oct	2003
4.77	55	Oct	2003
4.87	32	Oct	2003
4.10	37	Oct	2003
4.67	45	Oct	2003
4.67	64	Oct	2003
4.53	71	Oct	2003
4.90	37	Oct	2003
4.77	36	Oct	2003
4.73	39	Oct	2003
4.83	40	Oct	2003
4.63	39	Oct	2003
4.47	45	Oct	2003
4.80	66	Oct	2003
4.33	54	Oct	2003
4.37	41	Oct	2003
4.60	55	Oct	2003
4.70	48	Oct	2003
4.83	64	Oct	2003
4.93	87	Oct	2003
4.13	41	Oct	2003
4.80	69	Oct	2003
4.77	49	Oct	2003
4.60	75	Oct	2003
4.03	58	Oct	2003
4.77	66	Oct	2003
4.23	67	Oct	2003
4.60	70	Oct	2003
4.53	53	Oct	2003
4.77	50	Oct	2003
4.13	42	Oct	2003
4.20	32	Nov	2003
4.90	69	Nov	2003

Test Avg	AFQT %	Month	Year
4.20	39	Nov	2003
4.77	51	Nov	2003
4.83	53	Nov	2003
4.63	64	Nov	2003
4.27	31	Nov	2003
4.67	85	Nov	2003
4.37	66	Nov	2003
4.70	48	Nov	2003
4.30	50	Nov	2003
4.87	82	Nov	2003
4.93	84	Nov	2003
4.73	89	Nov	2003
4.57	81	Nov	2003
4.07	31	Nov	2003
4.83	82	Nov	2003
4.77	70	Nov	2003
4.73	54	Nov	2003
4.50	80	Nov	2003
4.83	91	Nov	2003
4.93	70	Nov	2003
4.73	56	Nov	2003
4.90	87	Nov	2003
4.93	99	Nov	2003
4.90	54	Nov	2003
4.63	50	Nov	2003
4.63	51	Nov	2003
4.97	91	Nov	2003
4.77	55	Nov	2003
4.87	41	Nov	2003
4.80	76	Nov	2003
4.40	53	Nov	2003
4.53	61	Nov	2003
4.83	59	Nov	2003
4.87	61	Nov	2003
4.67	66	Nov	2003
4.87	90	Nov	2003
4.93	88	Nov	2003
4.73	90	Nov	2003
4.40	54	Nov	2003
4.07	49	Nov	2003
4.67	56	Nov	2003
4.90	89	Nov	2003
4.27	56	Nov	2003
4.87	73	Nov	2003
4.80	73	Nov	2003
4.63	74	Nov	2003
4.80	65	Nov	2003
4.80	73	Nov	2003
4.90	72	Nov	2003

Test Avg	AFQT %	Month	Year
4.83	70	Nov	2003
4.73	71	Nov	2003
4.07	45	Nov	2003
4.87	74	Nov	2003
4.80	84	Nov	2003
4.30	55	Nov	2003
4.73	49	Nov	2003
4.77	87	Nov	2003
4.63	62	Nov	2003
4.87	79	Nov	2003
4.87	76	Nov	2003
4.53	37	Nov	2003
4.73	44	Nov	2003
4.70	34	Nov	2003
4.83	79	Nov	2003
4.97	79	Nov	2003
4.90	80	Nov	2003
4.97	88	Nov	2003
4.63	53	Nov	2003
4.87	71	Nov	2003
4.60	82	Nov	2003
4.73	58	Nov	2003
4.87	89	Nov	2003
4.90	64	Nov	2003
4.40	47	Nov	2003
4.60	77	Nov	2003
4.63	84	Dec	2003
4.43	71	Dec	2003
4.40	67	Dec	2003
4.67	73	Dec	2003
4.77	53	Dec	2003
4.80	82	Dec	2003
4.60	35	Dec	2003
4.83	78	Dec	2003
4.63	79	Dec	2003
4.70	57	Dec	2003
4.50	61	Dec	2003
4.47	59	Dec	2003
4.57	43	Dec	2003
4.57	74	Dec	2003
4.53	42	Dec	2003
4.83	48	Dec	2003
4.87	76	Dec	2003
4.73	87	Dec	2003
4.57	31	Dec	2003
4.80	72	Dec	2003
4.53	65	Dec	2003
4.83	72	Dec	2003
4.90	84	Dec	2003

Test Avg	AFQT %	Month	Year
4.60	35	Dec	2003
4.67	42	Dec	2003
4.90	99	Dec	2003
4.77	59	Dec	2003
4.63	49	Dec	2003
4.77	70	Dec	2003
4.57	53	Dec	2003
4.73	62	Dec	2003
4.73	61	Dec	2003
4.17	44	Dec	2003
4.80	51	Dec	2003
4.77	69	Dec	2003
4.70	65	Dec	2003
4.90	99	Dec	2003
4.70	90	Dec	2003
4.83	77	Dec	2003
4.77	75	Dec	2003
4.77	67	Dec	2003
4.47	35	Dec	2003
4.80	63	Dec	2003
4.87	77	Dec	2003
4.83	99	Dec	2003
4.93	67	Dec	2003
4.40	41	Dec	2003
4.47	75	Dec	2003
4.73	97	Dec	2003
4.67	80	Dec	2003
4.77	42	Dec	2003
4.57	57	Dec	2003
4.97	94	Dec	2003
4.53	34	Dec	2003
4.23	68	Dec	2003
4.60	33	Dec	2003
4.73	56	Dec	2003
4.70	70	Dec	2003
4.77	74	Dec	2003
4.47	41	Dec	2003
4.57	53	Dec	2003
4.87	92	Dec	2003
4.67	69	Dec	2003
4.90	82	Dec	2003
4.37	42	Dec	2003
4.87	91	Dec	2003
4.33	37	Dec	2003
4.17	33	Dec	2003
4.70	81	Dec	2003
4.67	97	Dec	2003
4.57	58	Dec	2003
4.63	52	Dec	2003

Test Avg	AFQT %	Month	Year
4.93	78	Dec	2003
4.87	88	Dec	2003
4.87	88	Dec	2003

APPENDIX B. ACRONYMS

AFQT	Armed Forces Qualification Test
AFQTPCT	Armed Forces Qualification Test Percent
ANOVA	Analysis of variance
ASVAB	Armed Services Vocational Aptitude Battery
DOD	Department of Defense
F	F distribution test statistic
MSE	mean square error
MSTr	mean square for treatments
NSTC	Naval Service Training Command
Q	Studentized range distribution test statistic
RTC	Recruit Training Command
URI	upper respiratory illness

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